The COMPLETE SCIENCE of FLY FISHING AND SPINNING

FRED. G. SHAW, F.G.S.

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2nd

Edition

Signed

Presentation

The School for Salmon and Trout Fly Casting.

Established 1906

BY

FRED. G. SHAW, F.G.S.,

AT

5, Marlborough Road,
St. John's Wood.

Mr. Shaw has perfected the fly casting of over 4,000 clients during the last fifteen years, including a great number of Ladies, Children, Officers in His Majesty's Naval and Military Forces, School Boys, and well-known public men.

OPINIONS OF THE PRESS.

COUNTRY GENTLEMAN, 1908:

"No better teacher than Mr. Shaw could be wished for."

MORNING POST, DECEMBER 30TH, 1907:

In Mr. Shaw, than whom there are few more business-like exponents of the art and practice of fly fishing for trout or salmon, we have an example of the man of action and man of thought in one. Of his ability to teach the beginner and improve even the veteran amateur no one will have any doubt. . . . He has all the practice of fly fishing at his fingers' ends, and he has also a wholly practical way of imparting his knowledge to others."

DAILY EXPRESS, 1913:

"The greatest living master of the art."

EXTRACT FROM THE ANGLER, 1914:

"But life is too short to-day, work is too strenuous, and the world moves too quickly to permit one to devote years to an art which Mr. Shaw demonstrates —and demonstrates brilliantly—can be mastered in a few hours."

SCOTTISH FIELD, 1914

"Mr. Shaw was the Amateur Champion of trout fly casting from 1904-1908, and the things he cannot do and cannot teach others to do with a rod and line and fly are not included in the Angler's art. Alike on the casting lawn at his own address, and by the waterside in actual pursuit of the gentle art, he gives those who entrust themselves to his teaching more knowledge and skill in an hour or two's instruction than many would-be fishers acquire in the course of a long life."

The School for Salmon and Trout Fly Casting.

THE CASTING LAWN.

DAILY CHRONICLE, JUNE 6TH, 1915 :" A Master Angler " :

" Mr. Shaw has a rare ability for teaching his pupils the art of using a fly rod, so that it becomes a pleasure to them to cast with it—fish or no fish. What Mr. Shaw does not know about fly fishing is little worth knowing. The pupils he has taught to cast number close on four thousand, varying in ages from seven to seventy-five, and those who are conscious of imperfections in their methods of casting will be glad to learn that all they need to remedy what's amiss is a few lessons from Mr. Shaw."

SOUTH AFRICA, JUNE 5TH, 1915 :

" His methods are faultless not only on paper but in practice."

WESTERN MORNING NEWS, June 12TH, 1915 :

" Mr. Shaw has long been known as a most successful teacher of casting and spinning at his school in St. John's Wood."

THE QUEEN, JUNE 19TH, 1915 :

" Mr. Shaw as an authority on the subject of fly casting needs no introduction. His methods of teaching how to cast a fly have long been known as quite remarkably successful. He can teach the veriest duffer to throw a good long line, and to do other things that are necessary for catching fish."

BAILY'S MAGAZINE, JULY, 1915 :

" Mr. Shaw has evinced such skill that his school has become one of the recognised institutions of this genuinely sporting phase of fishing. . . ."

THE NOTTINGHAM GUARDIAN, MAY 27TH, 1915 : " *Aids to Waltonians. Expert advice on a fascinating sport.*"

" Mr. Shaw is practical. Abundant evidence is given by those who have studied under him of the skill with which he can personally impart his great knowledge to others."

CANADA, JULY 3RD, 1915 :

" Well-known as the most gifted and successful teacher of the various methods of fly casting and baitspinning in the world."

The School for Salmon and Trout Fly Casting.

THE CASTING WATER.

A few extracts from innumerable testimonials sent to Mr. Shaw.

FROM A WELL-KNOWN SINGER, *March 14th*, 1912 :

" I never had a blank day the whole time I was there—my average was eight fish a day, averaging between ¾ lb. to 1½ lb.

" I must say that I chiefly owed my success to your excellent tuition—I put into practice the various casts you taught me, and I was able to cast and fish in different places where I should never have dreamed of attempting to cast had I not had lessons from you. It was invariably in the awkward places that I got my best fish.

" You have a wonderful gift of not only making your pupils *understand exactly what you want them to do but of making them do it !* It is no exaggeration to say that in the few lessons I had with you, you improved my casting 75 per cent., and you made me do things that I thought were practically impossible. Please accept my sincere thanks for all the trouble you took on my behalf. With kind regards, Sincerely yours,

---

Mr. Reginald D. Hughes, a first cousin of Mr. Shaw and the best known tournament caster of the present day, owes his success to the tuition he received from Mr. Shaw. He wrote to him as follows :

20th November, 1907.—" Many thanks for your letter and your good offer. It is good enough to accept unreservedly. I will place myself in your hands and naturally, if successful in any degree, will award you all due credit for the achievement, as *so far I cannot throw any great distance, but can only make myself understood by the trout.* . . I have never handled a salmon rod."

(The definite " good offer " alluded to above was that the author would coach him in Trout and Salmon Fly casting gratuitously, find him in rods, etc., and pay his expenses, on the understanding that he (Mr. Hughes) would not coach professionally in London or its vicinity.)

30th March, 1908.—" I got out thirty-one yards with the trout rod a week ago."

8th April, 1908.—" I have repeatedly done forty-two yards with your old Farlow salmon rod, and it seems the limit of the rod."

In July, 1908, Mr. Hughes, after winning one first prize, as well as being second and third in other events, at the eleventh International Fly Casting Tournament at the Stadium, wrote as follows :

" Once again I must thank you. If another tournament comes along, I shall hope to make a much better show." (Which he has done).

Mr. Hughes, ignoring the above obligations and relying on what he terms the Statute of Limitations, has started professional coaching in London.

The School for Salmon and Trout Fly Casting.

Mr. Shaw on his Casting Lawn illustrating the backward cast (salmon rod).

These beautiful private coaching grounds are situated within one minute's walk of Marlborough Road Station, close to Lord's Cricket Ground, and about ten minutes by taxi from Piccadilly Circus.

FROM ADMIRAL LORD CHARLES BERESFORD, *29th September*, 1917:

"I have been fishing in Scotland, where I met two ladies who had not fished before. They both threw a beautiful line and told me you had taught them. I have fished all my life and in many countries about the world, dry fly and wet fly, and been very successful, but I was a long way from being good with the dry fly before I came to you."

FROM GENERAL SIR CHARLES DOUGLAS, K.C.B., *June* 15th, 1913:

"Your lessons have taught me a great deal. Your own mastery of the rod and line is wonderful and no one could be a better or more painstaking teacher."

FROM COLONEL F. THOMASSON, *May 30th*, 1919:

Those trout are not half so smart as I used to think before I came to you, and I am already indebted to you for three of the most delightful days I ever spent in my life—the forerunners, I hope, of many more.

For Terms, Original Testimonials and Particulars of this School apply to FRED. G. SHAW, School for Salmon and Trout Fly Casting, 5, Marlborough Road, N.W. 8.

THE COMPLETE SCIENCE OF FLY FISHING AND SPINNING

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From the painting by the late T. G. Targett

ENOUGH TO MAKE A PARSON SWEAR. BROKEN

To Doctor Wolfgang Grothmann
with the kind wishes of the Author
Grothmann's handwriting Fred'k G. Shaw.
April 9th 1929

THE COMPLETE SCIENCE OF FLY FISHING AND SPINNING

BY FRED. G. SHAW, F.G.S.

ASSOC. M.INST. C.E., M.M.S.

AMATEUR CHAMPION TROUT FLY CASTING AT THE INTERNATIONAL TOURNAMENT, 1904/8

WITH 152 ILLUSTRATIONS

AUTHOR OF

"THE SCIENCE OF DRY FLY FISHING"
(Bradbury, Agnew & Co., Ltd., 1906)

"THE SCIENCE OF DRY FLY FISHING AND SALMON FLY CASTING"
(John Murray, 1907)

"OUR FUTURE EXISTENCE, OR THE DEATH-SURVIVING CONSCIOUSNESS OF MAN"
(Stanley Paul, 1912)

"THE COMPLETE SCIENCE OF FLY FISHING AND SPINNING" (First Edition)
(Fred. G. Shaw, 1915)

"THE SCIENCE OF SELF DEFENCE"
(Fred. G. Shaw, 1919)

SECOND EDITION

LONDON 1920
FREDERICK GEORGE SHAW
5, MARLBOROUGH ROAD, N.W.8

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OTHER WORKS BY THE SAME AUTHOR.

"The Empire's Salvation."

"Comets and their Tails, and the Gegenschein Light."

"The Pseudomorphic Theory of the Witwatersrand Conglomerates."

"The Chinese Question."

"The Ancient Miners of Rhodesia."

"A National Policy."

"Fiscal Facts and Fictions," etc.

"The Science of Self Defence."

"The Science of Physical Instruction."

FOREWORD

THE delay in publishing this, the Second Edition of "The Complete Science of Fly Fishing and Spinning," has been due to the difficulty of obtaining the requisite paper for its many plates and for the text. The careful revision which the author has made will be found to have increased its value to the fisherman.

The First Edition of this work has been widely read in America and in the Colonies, and the interest it has created has fully justified the very kind reviews with which its introduction was greeted by the Press.

The chapter on "The Scales of the Salmonidae and the Story They Tell," has undoubtedly tended to modify the theories advanced—somewhat hastily—by those who have relied on the marking of salmon scales, as affording a trustworthy indication of the number of times a salmon has spawned.

In the First Edition, the author introduced to the public for the first time the virtues and advantages of "Muscabane"—the only infallible anti-insect cream—prepared by Messrs. Allen & Hanbury. It is pleasing to note that the use of this cream has tended very greatly to the comfort and health, not only of fishermen, and of our soldiers in Europe, Mesopotamia, etc., but of artists, travellers, sportsmen, and those who lead an outdoor life.

The diagrams in connection with Fly Casting and Spinning have simplified, to a large extent, those difficult problems which are invariably associated with the efforts of the tyro.

FOREWORD

The author has suffered, in common with the rest of his countrymen, as a consequence of his inability to obtain from the manufacturers of Great Britain many of the fishing appliances he has patented.

Owing to the popularity of the author's School for Tuition in Fly Casting and Spinning, situated in St. John's Wood, it has not been necessary to continue to advertise for clients. His long continued success as an instructor of Fly Casting, has brought into the field other instructors, among whom is Mr. Reginald D. Hughes, one of his earlier pupils.

The author concludes by wishing a " taut line " and continued good health to his many clients and readers.

FRED. G. SHAW,
5, Marlborough Road,
N.W.8.

October, 1920.

PREFACE

In writing this book the author has endeavoured to confine his text entirely to subjects that he thinks will interest every fisherman and be of assistance to those who, owing to lack of opportunity, are neither experienced nor skilful. Even when he has ventured to express his opinion on controversial subjects he hopes that his views will cause offence to none.

The average fisherman may not want to know how to build a rod—but he certainly wishes to know how to select one and how to use it. He may not want to make his own flies—but he certainly desires to know what flies to get and when and how to use them. He does not want to make his fishing line—what he wants is to know how to extend it and how to preserve its usefulness.

If it be desirable and necessary to obtain help in order to become a proficient fly fisherman, the author admits the great advantages of personal tuition when it is obtainable. But, on the other hand, he is confident that, by explaining in simple language the science of casting and fishing with the fly or minnow, in similar terms to those which he uses when teaching the student personally, he can help the reader to acquire, by careful attention, a success which will well repay him for his trouble.

When one recalls the pleasure and assistance which have been derived from the literature devoted to fly fishing, the pleasant reminiscences which have been revived, and the extensive fields of sport which have thus been thrown open, it would indeed be ungrateful to deny the

efficacy of written instructions on this delightful science, but the author cannot too strongly deprecate the assumption that this book is written with the view of attempting to teach experienced fishermen. It is written especially for those who are thinking of taking up the sport, and if the author should be successful in imparting to these the skill which has afforded him so many happy hours, and if, in addition, some of his ideas and methods may happen to interest his brother fishermen, he will, in some measure, repay the debt which he owes to a kindly Providence for giving him so many delightful opportunities of fishing.

No kill is quite equal to that of the first salmon; no thrill can exceed that which runs from the fisherman's hands to his brain as he braces his muscles to resist the first rush of a fresh-run salmon, feels the long downward strain on his rod, and hears the screech of the reel as his first fish plunges down-stream in its initial rush for safety; no tension is more delightful than the first twenty minutes spent with a clean-run salmon; and no satisfaction, so far as the sport is concerned, can possibly exceed that felt by him as the gleaming silver sides of his first fish emerge from the water securely held on his gillie's gaff. The vigour of the sport, the grandeur of the scenery, and the revivifying atmosphere of his surroundings, offer a tonic to the system far more pleasant and of infinitely greater value than any the pharmacopœia is capable of producing. The contest between the salmon and the fisherman is more severe, longer, and the result more uncertain than that between the trout and man, and—during the time the struggle lasts—no fisherman would deny that salmon is infinitely superior to trout fishing; but during all the other hours of these two sports dry fly fishing for trout may with justice claim precedence as the most attractive form of angling.

While the fisherman's sporting instincts will be aroused by the difficulties and thrilled by the triumphs of salmon fishing, the artistic and poetic side of his temperament will be as strongly appealed to and affected by the charms of trout fishing.

The salmon river will inspire the mind with the strength and force of its beauty, and invigorate the body with the health-giving scent of its pine forests and heather; the trout stream, on the other hand, will lull the senses into delicious content, as the rippling notes of its liquid harmony are heard, and the delicate perfume of its surrounding flowers is inhaled, while the eyes will be soothed by the varied shades of the leafy surroundings of these haunts of the trout, and by the exquisite pictures reflected from the surface of their limpid depths.

Hardly any water-side exists which fails to interest and attract the fisherman, and the pleasure of wandering by the side of any brook or mountain stream and watching the changing beauties and the wonder of its natural life is always enhanced by the infinite probabilities of sport which it suggests to the ardent angler, and the recollections which it arouses of sunlit days and happy associations of the past.

The author's thanks are due to many who have kindly assisted him in writing this book, and their names will be noticed from time to time in its pages. He cannot, however, omit a special reference to the kind assistance which has been given to him by his secretary and friend, Miss Helen Stanton.

The author has but recently discovered that much of his own experience and advice on fishing for trout is supported by the admirable writing of the late Mr. Francis Francis in "A Book on Angling," in which work there does not seem to be any aspect of fly fishing to which this gentleman has not lent the charm of his pen and the wisdom

of his experience, and although the author cannot add to his text, yet he has ventured to give a few footnotes of quotations from the book in question.

The spirit echoing through some lines written by Mr. W. Gilchrist Wilson will most certainly touch a sympathetic chord in the minds of most fishermen.

To an Unknown Angler.

"Following the course of a mountain stream we came to a rude grave, a few slates put loosely together. Its history is not known, but some say it is that of a fisherman—of the early part of the last century." (1700).

Sleep, unknown comrade, sleep
Securely in thy cool
Slate bed, where mountain steep
Purples the long, slow pool.

Barely a cast away
Aura rolls softly by,
Only a trout at play
Breaks Nature's sympathy.

Yet still we hear thy reel
Go ringing down the stream—
An unknown presence feel,
And know we do not dream.

For we are anglers all
And ply our gentle trade
By ripple, rush and fall—
Pagan and not afraid.

Then let us not repine,
But wait our turn, and so
Reel in our little line,
Shoulder our creel and go.

F. G. S.

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THE COMPLETE SCIENCE OF

FLY FISHING AND SPINNING

CHAPTER I

FLY FISHING FOR TROUT

A consideration of fly fishing—The necessity of learning how to cast—Wet and dry methods of fly fishing compared.

It cannot be claimed that there are any odds, as between a man and his quarry, which are more evenly balanced, or of more sporting a character, than the chances which lie between the safety of the trout on the one side, and the success of the dry fly fisherman on the other. No fish is more alert or more wary than the trout, and certainly there is no pursuit more engrossing, nor any sport more fascinating, than this method of trout fishing, and I think it may be maintained with justice that dry fly fishing takes a place second to no other pastime in the world.

The most acceptable of our successes are those which can be directly traced, or even attributed, to our own mental or physical efforts, and for that reason the ability to cast a trout fly accurately and delicately is a pleasure which in itself is a sufficient reward at the end of a day's fishing, though that day may be almost barren as regards the take of fish.

The satisfaction which accompanies the perfectly understood and successful use of a fly rod is undoubtedly increased by the pleasure which is felt by the fisherman who, after all too short a day spent by some lovely trout stream, can

on his return home produce a dish of speckled beauties as a tribute to his knowledge and the successful use of his treasured rod and delicate tackle.

There are but few accomplishments more delightful to witness than the handling of his rod, line and fly, by the skilled dry fly fisherman. It is not alone the grace and ease which accompany the varying and always beautiful curves assumed by his rod and line which compel the admiration of the onlooker, but it is equally due to the instinctive recognition of the science or art which lies behind the exquisite result of each cast. But if the casting of a skilled fisherman be so admirable, can there, on the other hand, be any failures more humiliating than those which accompany the efforts of the unskilled fly fisherman.

This book, however, is not written to extol "the gentle art," but with the serious object of assisting those who may be anxious to learn the science of fly fishing; and for his comfort I can assure the beginner that it is by no means a difficult or a lengthy process for him to acquire an absolute and exact method of casting a fly, so that he may be able with certainty to present his lure accurately and delicately to the trout in ninety-nine out of every hundred chances which occur in an average day's fishing.

A well-known writer on piscatorial matters says: "For my part, indeed, I am inclined to believe that the best way to become an accomplished dry fly fisherman is, in these particular methods, to steer clear of teachers and preachers, either in the book or in the flesh, get down to the water, look out for rising trout, and hammer away till one is at length hooked and landed, after very many have been scared."

Although this advice was seriously meant, and although other writers and many fishermen have argued on similar lines, they have all admitted the length of time required

before a novice is able to cast a fly in anything like a satisfactory manner. Such mentors might just as well advise an absolute novice at cricket to don some pads, borrow a bat, face the bowling and fielding of an Australian eleven, and slog away until he has made a century, or acquired the skill of a Grace or a Palairet.

How many fishermen can say that they owe nothing to the advice or assistance of others in their attempts at handling the rod? To my infinite delight I caught a trout when only four years of age, but my father was there all the time; and although I have since then fished for over fifty years and in most parts of the world, I never realized how absolute is the science which controls a perfect method of fly and bait casting until within the last few years, and until I had spent those years in perfecting the casting of others.

The Necessity of Learning how to Cast

With every respect, then, for the fishing abilities of the writer above quoted, I am fully persuaded that the one thing a novice can and should do before he goes down to "scare the trout" is to learn the art of casting a fly.

Not only should the *novice* endeavour to obtain instruction, but it might well repay the experienced fisherman to find out whether he can improve his style and acquire absolute accuracy in his casting, and even if the expert be well satisfied in these respects, to ascertain whether there may not be other styles of casting which might help him to get his fly to any desired spot under circumstances and against difficulties which have hitherto appeared to him to be insurmountable. Since my first work on Fly Fishing was published, some fourteen years ago, I have established a school for trout and salmon fly casting, and for spinning, and I have had the pleasure of coaching in this school

over 1,800 clients. This work, supplemented by a most exhaustive study of the whole science of casting, has shown me that it is possible to teach anyone an accurate and perfect style of casting a fly, with or against the wind, in both the wet and dry fly methods, with both hands, in three or four lessons, each of one hour's duration. Further, this experience has shown me that if the country be fairly clear between the rod and the position of the trout, that a fisherman should under almost any circumstances be able to cast his fly accurately to a fish, so long as it be within a reasonable distance.

The clients whom I have coached have varied in age, from the youth of seven to the veteran of seventy-five, and while at least half of this number have come to me as complete novices in the art of fly casting, the other half have been more or less hardened in such faulty methods of casting that the pleasure which they should have experienced when fishing has been minimized by their inability to present their fly to the trout accurately, delicately, instantly and effectively, and my success in making them cast to their own and my satisfaction has more than repaid me for the difficulties I have had to encounter when coaching them.

The beginner should consider the saving in time and material which he will effect by first acquiring the ability to cast a fly, also the satisfaction he will feel in knowing that when he arrives at the water-side he will not appear as a novice to his brother angler.

I am convinced that the greatest success in fishing will attend the fisherman who, both in favourable and unfavourable circumstances, can with certainty cast the *lightest* and most *accurate* fly, and that to learn this will take him but a short time if he be properly coached ; that, without the assistance of a master in the art of casting,

many, if not all, the years of the average man's fishing life will be stultified by mistaken conception and faulty efforts to acquire an art which would otherwise have taken him but a few hours to perfect.

When a student is able to cast his fly lightly and accurately in any required direction, he can then seek his trout stream, and be in a position to fish with ever increasing delight and confidence. With a little advice from any experienced fisherman his progress should be rapid; he should have nothing to unlearn, and may, indeed, so far as science in actual fly casting is concerned, step down to the water-side more assured as to his casting than the one from whom he has in other respects very much to learn.

Wet and Dry Fly Methods of Fishing

There are two distinct and widely different methods of fishing with a trout fly, and these are known as the dry and the wet fly methods.

In the former, one fly only is used. This fly is cast up-stream just above the rise, or above the spot at which the trout is supposed to be lying, and is allowed to float down towards the fish on the surface of the water.

In the latter, from two to four flies should be attached to the cast. These are cast either across and up-stream or across and down-stream, and in both cases are allowed to sink below the surface of the water. Wet fly fishing is in itself thus divided into two distinct variations. In the down-stream method of wet fly fishing the flies, at the end of a long line and cast, are allowed to sink well below the surface, and to be carried down-stream towards every spot where trout may be lying. The stream is thus thoroughly searched by the flies, both fish and lure being invisible to the angler, and, in consequence, no dependence can be placed on the rise of the fish being seen, the angler having, in most

cases, to trust to his sense of touch for a knowledge as to when his fly is taken.

In the up-stream method of wet fly fishing, a short line is used, and each cast is made with the definite object of fishing either for a rising or for a feeding fish, whose position is therefore either known or assumed. The flies are allowed to sink a few inches below the surface and the rise of the fish should, in consequence, be more apparent to the angler, the fish in this case being mostly hooked by the angler's initiative in striking. This style of fishing is undoubtedly more interesting than fishing with wet fly down-stream.

In wet fly fishing up-stream the successful angler, in four cases out of five, is dependent on his skill and alertness in striking for his fish. In wet fly fishing down-stream the angler is dependent in four cases out of five on the chance of the fish hooking itself, and in this respect alone it will be admitted that the greater interest must centre in fishing up-stream.

Advantages of Both Methods Compared

I am convinced that the general consideration of the relative merits of these two methods of fly fishing is often obscured by the overshadowing idea of filling the basket. This anxiety, however, has had but little influence on those who have been instrumental in bringing Dry Fly Fishing into favour on our chalk and other trout streams.

To the dry fly fisherman the weight of his creel takes second place to his love of the methods he employs. Personally I prefer to fish with a dry fly, even if I achieve nothing but an occasional rise, to fishing with a wet fly, and killing a number of fish. Nay! I can regard with perfect composure the success of a brother angler, who, in using the wet fly, or even the worm, on the same water

that I am fishing, fills his basket and finds me with but a brace of fish. It is the delightful method, more than its success, which makes the dry fly fisherman.

However, whether the angler elects to fish by the dry or wet method, or whether he may be spinning a minnow or throwing a salmon fly, the essential object he has to achieve is to throw his line in the lightest and most accurate manner. He should remember that the more nearly he can extend his line in a horizontal direction in the forward cast, the more lightly will his fly or line fall on the surface of the water. Lightness and delicacy of casting are especially necessary for dry fly fishing, as the line has to be cast more or less over the trout, and success will depend, therefore, to a great extent on skill in casting.

If the dry fly fisherman be using a fly similar in size and appearance to that which is being taken by a *rising* fish, and if his cast and line be thrown so that the fly alights accurately and delicately at from two to four feet above this rising trout's position immediately after a rise, and the fly is permitted to float on the surface of the water over the rising fish, the odds on the fish rising again to this fly will be about level; but if the fisherman owing to his first cast being faulty, or to any unnatural movement of the fly, has to make a second cast, the odds against a rise will be as ten to one; and if, for a similar reason, a third cast at the same fish has to be made, the odds may be regarded as about a hundred to one against a rise.

Since I first ventured to express this axiom I have been flattered by hearing that the late Mr. G. C. Marryat, one of the most eminent of dry fly fishermen, formulated an almost similar axiom. I think, however, the odds he expressed against the third cast being successful in producing a rise were as fifty to one.

To be successful in either of these methods of trout fly

fishing requires in addition patience, experience and observation.

Many excellent fishermen confine their fishing to either the wet or dry fly method, but while the most successful fisherman generally will be he who is in reality the master of both, there can be no question as to which method of fishing requires the greater skill or affords the more delightful and interesting pastime.

Even on such classical waters of dry fly fame as the Itchen or the Test there are days when the trout who cannot or who will not see the floating fly may yet be caught on the sunken one.* Again, there are times on northern loch or on the waters of wet fly streams when the wet fly expert may use his sunken lures in vain, but when the fish will eagerly take the floating fly. Both wet and dry fly can be used with success on the same day. The Rev. Hamilton Young caught in one day, on the Deveron, forty-four pounds of trout, using both wet and dry fly methods. Here is the entry from his diary :

> " *The Deveron, May* 10, 1899.—Fished from 9.30 to 1.30 with wet fly, using the Hareslug and Yellow Cotterel. Wind south, rainy and squally ; then sun came out ; wind dropped. Fished with Olive Quill, and got most heavy trout. Total weight, 44 pounds."

It will be readily admitted, however, by those who are skilled in both methods that not only is the dry fly more successful in southern waters during May, June, July and August, but that, as a means to sport, it is infinitely more fascinating and delightful than the wet fly. The tendency of every wet fly fisherman is toward dry fly fishing, and the often repeated statements, " Oh, it is too scientific for me," " I should like to learn," etc., are my apology for dealing

* On this subject, " Minor Tactics of the Chalk Stream," by Mr. Skues, is a book well worth reading.

THE DELIGHT OF LIVING.

THE DRY FLY ON A SCOTCH RIVER (THE DEVERON).

mainly with the dry fly method. The dry fly enthusiast may find in this work some points with which he disagrees, yet I trust that the attempt to explain my views of the science of dry fly fishing may at least be of use to the wet fly fisherman and the student. It will be, therefore, the art of dry fly fishing to which I shall first turn the student's attention, dealing with the wet fly later on.

CHAPTER II

DRY FLY FISHING. A DAY'S COACHING ON A TROUT STREAM

Preparation for a day's fishing—Approaching the water—The fly and the rise—Different aspects and methods of fishing—Oiling the fly—Greasing the line—Fishing the stream—Striking—Changing the fly—Netting the fish—Methods when fishing—A taut line—The rise and its advantages—Fishing the rise—Striking discussed—Keep your eye on the fly—A jumping fish—Undersized fish—Handling a trout—A killable age—The broken hook—The fly retriever—A big fish.

I will assume that my reader has already mastered the ordinary overhead style of casting a fly,* and that therefore he is competent to begin fishing for trout. He is not obliged to know or acquire other styles of casting, however much these would add to his pleasure and skill in fishing, but as this is his first visit to a trout water, and as he may have no friend at hand to answer his questions, to show him where to throw his fly, or to tell him the nature and habits of the speckled beauties he is so anxious to secure, I must lead him still further afield in the study of this delightful and engrossing pursuit, and show him not only where to cast his fly, but how to determine what fly he should use, where the fish are to be most readily found, and how to catch them.

With this object will you come with me for a few hours' dry fly fishing. You can leave the rod and line with which you have been practising at home, but first remember to

* See instructions contained in Chapter IX., as to the method of learning to cast a dry fly.

unwind that portion of the line which has been previously wetted. Make it up in your hand (if you have no winder) into large loops ; put your rod on the horizontal rests and hang up your winder, or put the loops of the line on the butt of your rod. A fishing-rod should always be supported in three places at least—each end and the middle. We will take my own rod, which is all ready for use, with gut cast and fly attached. The first thing to be considered is whether we have everything we shall want, and if we are quite prepared for our fishing. Let us see. Are you well shod with good serviceable watertight boots with plenty of nails ? All right. Then, as you have your tobacco, pipe, and matches, and some sandwiches, never mind anything else to-day. I have all that is required—my creel, my net, etc. Your tweeds are a good colour, but you had better put on a soft cap, as that straw hat of yours is too conspicuous. And now, while we are walking down to the lower end of our water, we can discuss the nature of the day's sport. We shall fish—that is, cast the fly—up-stream, which, except when fishing on still water, is essential for dry fly fishing. The dry fly must not be influenced by any motion of the line or rod after it has alighted, and by casting up-stream the fly floats down towards the fisherman, who steadily takes up the slack line as it comes back to him, either by the hand, the reel, or by raising the point of his rod, but in whichever way the slack line is raised off the water, it must not interfere with that portion of the line and cast near the fly. The fly must float easily and naturally down stream as any drag or movement imparted to it will most certainly scare the ordinary trout.*

The dry fly fisherman, all circumstances being alike, is far less likely to be seen by the trout than is the wet fly

* For full instruction as to the best method of gathering in the slack line when fishing out a dry fly cast, see page 50.

fisherman, and consequently can take his sport more at his ease. For he of the wet fly who fishes up-stream has to use a shorter line, and is consequently nearer the fish, while he who fishes down-stream is faced by the trout, and has to exercise the greatest caution in order to escape observation. Trout lie invariably with their heads pointed up-stream or against the current, and are in consequence looking away from the up-stream, but towards the down-stream fisherman. Trout can easily see from a point right ahead to an angle of 150 degrees on either side in the plane in which they are lying, leaving an angle of about 60 degrees in which the fisherman may escape observation, provided he is not perched too much over them, so that in fishing outside this zone of safety he must endeavour to be as near the surface of the water as possible (see "The Vision of Trout," p. 88). This position of the trout, facing up-stream, is also an important advantage to the angler when fishing up-stream, for when striking his hook will be pulled back into the mouth of the trout, instead of being pulled from or out of the mouth of the trout, as is the case when fishing down-stream. See p. 91.

As we are now approaching the stream, we will look at the water and see if anything is moving. By standing here and looking up stream we shall not scare the fish, and in order to see if the trout are feeding we must look out for any unusual movement on the surface of the water, such as the ring or dimple made by a rising fish. No, there is nothing moving yet ; it is perhaps a little too early or not quite warm enough to tempt the sub-imago—*i.e.*, the first flying state of the various water insects—to leave their shelter on the banks of the stream, or to impel the pupæ to come to the surface in order to enter their aerial life, and therefore, until some forms of insect life begin to move on or to the surface, the trout are not likely to rise. In my

creel is a small and light telescopic butterfly-net and priest; it is ready for use in a few seconds, and by its aid I catch that gnat-like fly floating on the water. It is a flying form of water insect life called the Blue Quill, the very fly the trout were taking yesterday. Look! There is another one on the water floating down, probably one of a previous so-called hatch of the same fly. I will catch him to make certain. Watch how I do it. I slip the net into the water just in the way of the fly, which floats into it. Here he is, clinging to the muslin. Now look at these two flies carefully. You can see at once that both are just like the Blue Quill fly on my line, one of the best-known flies on southern English waters. If you fit this watchmaker's magnifying-glass into your eye, you will notice more distinctly the colour and appearance of its delicate wings, its body, and its legs.*

Now we will see if there is any rise. No, there are no signs of a move yet, as the pupæ which will form to-day's hatch are possibly waiting among the weeds until the water becomes a little warmer or perhaps altered by some meteorological change, before rising to the surface, and therefore the trout have not been as yet excited by their appearance.

We had better, therefore, continue our walk down to our starting-point at the lower end of our water. What! You saw a rise? Where? Oh, I see. That is not a trout, but a water-rat. See him working his way up-stream among the rushes and under the long grass of the bank. Notice how he makes a long slanting, rippling line from the bank out into the stream, instead of the detached ripple or

* If a fly is caught the name of which is unknown to the student, it should be compared with the flies in his fly box and its name thus ascertained, or placed in a small specimen bottle and either shown to a friendly authority or forwarded to the author of this book or to the retailer with whom the student may deal. By this means a general entomological knowledge will be obtained. A single watchmaker's glass is always a most useful adjunct to carry in your fishing bag, also a small butterfly net.

ring peculiar to the rise of a fish. The rise of a trout varies in size, from the most delicate circular dimple of the big fish feeding near the surface, to the splash and wave made by some small fish as he jumps clean out of the water, in his eagerness to get the fly. We will now go on down-stream, keeping well away from the water, as we don't want to frighten the fish. Trout, as I said before, lie with their heads up-stream, and their attention is thus directed to any food which may come floating down toward them either on or below the surface of the water ; it is necessary, therefore, for the fisherman to find out what the trout are feeding on, and then present this food to them in the most natural manner possible. The wet fly fisherman does this by sinking his flies below the surface, and dropping them down-stream toward the fish, and the dry fly fisherman throws his fly up-stream on the surface of the water, and above the trout, and lets it float down to the fish.

The food which the wet or dry fly fisherman has to imitate, in order to attract and secure the trout, are the various forms of water insects, either in their larval, sub-imago or imago state. The transition from the pupal to the sub-imago form is quite naturally, though erroneously, alluded to by most fishermen as " hatching." The water insect is *hatched* when it leaves the egg and enters the larval stage of its life, not when it undergoes the metamorphosis into the sub-imago, or imago state.

There is but little difference in the appearance of an Ephemera when it is bursting its mask and entering into its sub-imago existence and that of the sub-imago in a drowned condition, and it is therefore in these two conditions that the wet fly fisherman imitates its appearance and presents it to the trout. But it is only when this water insect is in its living and flying sub-imago or imago condition that the dry fly fisherman copies its appearance.

Hence you will readily understand that the latter has not only to use the more perfect and life-like form of fly, but to present it poised naturally and in life-like condition on the surface of the water. The wet fly fisherman can, on the other hand, present flies to the trout either on or under the surface of the water, and in a far less perfect condition.

Now, as the water is clear and the weather is warm, flying water insects will soon be numerous, consequently the fish will be taking the dry fly, and therefore we will first of all try our friend the Blue Quill; for two things are certain: that the fish were taking this fly yesterday, and also that there are some of these flies already on the water, and probably there will be an early hatch of the same kind before long. We have seen no rise, it is true, but we may be able to tempt a fish before the rise proper commences, and this I call "fishing the stream." When the rise commences we shall try for rising fish, and this I call "fishing the rise." There is more scientific knowledge required when fishing the stream with a dry fly than in fishing the rise, and the former is perhaps the more successful method throughout the day; for while the rise may be uncertain and very brief, fish can be taken at all times during the day, if a knowledge of the locality and the habits of trout be possessed, by casting the fly in the most likely spots, even though the trout are not rising in the strict sense of the term.

The dry fly fisherman should fish the rise when it is apparent, and fish the stream at all other times. It is impossible for anyone to see more than a limited extent of the water, even in his immediate vicinity, and innumerable rises may, therefore, escape his notice. Fish are not always feeding, and even when feeding are by no means always rising to the surface. It follows, therefore, that if a fly is cast in all likely places—while not omitting at the same time

to keep a sharp look-out for rising fish—trout will be taken whose rise has not been seen, or who may not have felt inclined to rise before seeing the angler's fly.

In both wet and dry fly fishing, you offer to the fish food which you consider is most likely to excite its desire, and you try to present this food in a manner most nearly approaching the natural conditions in which it is generally observed by the trout. If the catching of fish be the principal object of fishing, then the greatest importance must be attached to that method of angling which presents food, or imitations of food to the fish, in a form and in a manner most nearly approaching the occurrence and the appearance of the food of their every-day life.

During the course of the year, the food upon which the trout most commonly feed consists of worms, water shrimps, larval and pupal forms of insect life, and the drowned or partially submerged forms of flying or other insects, and as these only exist to the trout below the surface of the water, the most killing lures should be those which are submerged and which represent the above-mentioned foods.

But the occupation of trout fishing cannot now be regarded as a means of livelihood, but merely as a sporting pastime, which offers, at its best, a relaxation to our worries and our cares, or at least presents a very pleasant and charming variation to the pleasures of life, and it is for this reason that the style or the method of fly fishing which gives the greatest pleasure and which affords the keenest enjoyment with the least sacrifice of fish life, will be that which will eventually become the recognised method of fly fishing with sportsmen.

As the wet fly method of fishing superseded bottom fishing as a sport, so is dry fly fishing rapidly superseding much of the time hitherto spent on wet fly fishing, and however much may be said in favour of the latter, however killing it may

be in the early months of the year, however great is the art of using the sunken lure on a dry fly stream during the rest of the year—still, the method of dry fly fishing will, season by season, claim an ever-increasing number of devotees.

There are many excellent dry fly fishermen whose greatest pleasure is to devote themselves to killing some particularly big or wily trout, and who, with this intent, neglect other and more easily caught trout in order to creel this—the one object of their sport. There are others who will cast for none other than a rising fish, *viz.*, a fish which they or their gillie may have been lucky enough to notice when rising, and who, failing to spot such a rise, are content to linger for long hours mooning about the bank of the trout stream, until they or their man happen to spot a rising fish.* Such men look upon the fisherman who fishes for a fish which he sees, or which he knows will be located in any definite position—but which may not be rising—as a sort of poacher, or at the best as wanting in sporting instincts.

There are others—and good fishermen too—whose great pleasure is to see the fish before casting, and thus to have the delight of watching the rise, when they cast to the fish they have spotted. These at least are most likely to learn how to temper their methods to suit the fish, for they have the advantage of seeing the effect they produce when casting.

There are others—I am one of them—who may not possess the keenness of vision always to see the fish below the surface, who may not have the leisure to moon about a trout stream, waiting, like the sick at the pool of Siloam, for the stirring of the waters, but whose principal delight is that, by the skilfulness of their casting, their knowledge of the fish,

* A tendency fostered by their having to confine their fishing to a limited amount of water.

flies and stream combined, they are able to induce the fish, non-rising or otherwise, to rise to their fly.

I have known dear old friends of mine contented to sit in a hut, or on their mackintoshes, hour after hour waiting for a rise—which was occurring all through the day, unobserved either by them or their drowsy attendant—when had they been younger, possessed of more energy and knowledge of where the trout lay, they would have been enjoying the delight of casting a dry fly, and backing their knowledge and skill against the adverse circumstances of non-rising fish. As a well-known sportsman said to me: "I do not much care whether I catch fish or not, it is the delight of casting a dry fly to every likely spot which not only affords me a constant pleasure, but well repays a day spent by the river side."

Oiling the Fly

We have now reached our starting-point, and before commencing we will carefully examine our tackle. First let me caution you against laying the rod on the ground, as this is always dangerous; for even if you should never tread on it yourself, someone else might possibly do so. Press the spear, which should be always fitted into the butt end of the rod, firmly but delicately into a soft tuft of grass, and you have thus both hands at liberty. If you drive the rod into the ground with a jerk you will put a strain on to your winch, especially if it be a Nottingham one, which may injure it, and in any case a jerk can do no good to the rod. When you have no spear, place the butt of the rod on the ground and let the upper part rest against the body between the arms. You have, as before, your hands at liberty. Now the rod is standing up out of any danger, and we must look carefully at the gut cast and at the fly, and see that they are in good order. Everything

being all right, we must render the fly as buoyant as possible, and this we do by applying some odourless paraffin-oil.

The most convenient form and the cleanest and best method of carrying the oil necessary for this purpose is in a small box such as that which I have in my hand (see final chapter). The box shuts tightly and opens with a spring. Inside is a small pad of woollen felt, which should be saturated with odourless paraffin before leaving home. The fly, after being dried by switching the rod backward and forward, is pressed down by the finger and thumb on to this saturated pad, taking care not to injure the wings, and some of the oil held in the pad is thereupon transferred to the fly. In order to get rid of any superfluous oil, it is advisable to press the fly on the pad in the lid of the box.

I certainly advise you to apply some grease to the line and cast. I am by no means forgetting the prevalent idea that a floating cast may put the trout down, or that the life of a cast is injured by the use of fat. I do not think that a good and carefully prepared gut cast will suffer from the application of any pure fatty substance. In very clear water on a fine day, a floating cast will produce more shadow than the same cast when submerged, and on a well-fished and shallow chalk stream, the more defined the shadow cast by the line, the more likely is it to scare the trout ; but I have in other ways noticed the very great advantage which a floating cast possesses, and to secure this advantage I take care that my cast is sufficiently greased to float on the surface.*

In any case, I should advise the reader to use pure animal fats, and to avoid chemical mixtures, however much they may be advertised ; for although greasy to the touch, they have frequently a pernicious effect on the

* By a floating cast I mean one which will lie straight and evenly, and only partially submerged, on the surface of the water.

delicate lines and casts used in dry fly fishing. Now we are ready.

Fishing the Stream

You see, there are one or two more Blue Quill coming down, but no signs of a trout, and as we have plenty of water ahead, we will try and tempt the fish to rise to our fly. Now, this is where experience and stream lore are so necessary. Although brown trout alter their position, they seldom go far from their own particular retreat, yet the wind, the time of day, the heat or cold, the clear or thick state of the water, considerably affect their movements. Loch Leven trout are rarely stationary when feeding, moving from one position in a pool to another.

Loch trout, and I think Loch Leven trout in particular, when introduced into our southern rivers, are far more inclined to move from place to place in search of food than are the brown trout which inhabit them. The reason for this may be due to the inherited instinct of trout—indigenous to lochs—which have to seek their food, so far as flying insects are concerned, in ever varying localities in their domain; while the river trout are obliged to wait in the most favourable position near their place of refuge until their food is brought to them by the wind or by the current on one or the other side of the stream they inhabit. The trout in lochs, having to roam the water world of the lakes they inhabit for their food, are accustomed to gain security by flight into the comparatively limitless regions surrounding them.

To men who only cast for rising fish, Loch Leven trout on a deepish stream are a rather worrying proposition, for some time, at least, after their introduction—for they prefer the deeper pools, and as the movements of the fish under water cannot, or should not, be seen, and as the spot

at which the Loch Leven trout rises varies from moment to moment, the fisherman who only casts to the rise will, however correctly and quickly his fly may reach the spot at which the rise has taken place, be too late, for the fish will fail to see the fly, having moved off to rise again in some new and unexpected position. When, therefore, in such a case a feeding fish is seen at work it is of little use casting to its rise. The stream must be fished, and the fly thrown, so as to anticipate if possible its progress from one place to another.

The most successful fisherman is, therefore, he who has, from former experience, an intuitive knowledge of just where a trout is likely to be lying, and also what the trout is likely to be thinking about when there. So now, with no fish in sight—*i.e.*, rising—I yet feel confident that there ought to be a decent fish just at the lower side of the opening between those weeds, also that he is thinking about food, and that on this occasion it is floating food. I shall try, therefore, to place my fly about two feet above the opening, so that it will float down to where I think he is waiting. It is a nice easy cast of about fifteen yards right up-stream; the breeze is also up-stream, and therefore in our favour.

You will notice that I get my correct length of line, not by trial casting in the air *over* the fish, which would scare him, but by casting in the air to one side or the other. Now watch! There! The fly has fallen just in the right place. See, the wings are beautifully cocked, and the fly is sailing down through the opening of the weeds, and as it does so I take in the slack of the line as it comes back to me.* There! Tut! tut! I have missed him! Of course, I don't blame myself—fishermen rarely do so. I think, or say I think, he came rather short; but one thing is certain

* See "Slack line," page 50.

—he came at my fly. I flick my line backward and forward in the air twice, and my fly is quite dry again, so I will try once more. There! just as before: the fly floated down beautifully, but I missed him again.

Striking

While still emphasizing the importance of striking immediately the fish rises, it is advisable to warn you that there are some occasions when it may be better to vary such a practice. At the beginning of the rise of the May fly for instance, the trout and other fish appear to be somewhat shy of gulping flying insect food presented to them on a scale, comparatively speaking, larger than that of the ordinary flying insects upon which they feed, and instead of taking the new food boldly into the mouth they take hold of a part only of the fly, for the purpose, I think, of dragging it under water and investigating its character. If, then, at the beginning of a rise of May fly, or of any other flying insect, you fail to hook the fish you strike at, you will probably find it worth your while before striking, to give the trout time enough to shift his grip from what may be only the wing of the fly presented to him.

The failure to hook a rising fish then, may be due, first of all, to striking in a tardy or slow manner, and secondly, on rare occasions, to striking too quickly.

I have heard that a well-known authority on the entomology of our chalk streams has declared that in a May fly rise the numerals up to three should be repeated aloud after the trout has seized the fly, and before the strike is made. Any such dictum must of course be regarded as controvertible, however successful it may be under circumstances such as those mentioned above, or when the trout are "coming short," and "playing with" or "drowning" your fly.

The strike should be made as the trout rises at the fly, for the fish, after taking the fly, will as a rule turn down stream, then round, and up stream again to his original position, and the strike if delayed may pull the fly out of the mouth of the fish as it faces down stream and towards the fisherman.*

The big trout will reject a fly just as quickly as the small one, but the little trout is more likely to play with, to come short, or to wish to " drown " a fly than the former, and therefore at each rise there should as a rule be no delay in striking—but if the immediate strike proves abortive, then—and not till then—can a more delayed manner of striking be experimented with. When fishing with the natural stone fly, that is to say, the Northern May fly, when dapping with the natural May fly on the southern and Irish streams, unless the fish are rising furiously, it is better to pause for the fraction of a second in order that the fly, which may have been only partly seized, may be taken completely into the mouth of the trout. A natural fly, if properly attached to the hook, is less likely to be rejected than is the artificial, and the pause I now suggest is not likely to result in the rejection of a natural fly if it be only partially taken into the mouth of the fish, but will lead to a more complete seizure.

A pause before striking, however, is here worth trying, so that at the next rise we had better not strike until one second has elapsed. Now I dry my fly once more and cast again. There ! he is rising—now I strike—with no greater success than before. I will try him just once again—no luck !

* Francis Francis says :—" As to giving any direct rules when to strike, they would be of little avail, as sometimes fish rise quickly, and take quickly, sometimes with more circumspection, and sometimes altogether falsely. Practice alone will teach the angler what to do, and how and when to do it, and all arguments about it are mere waste of time."—*A Book on Angling*, 1885.

We will now give him a rest, and try somewhere else; as the fish are not on the shallows yet, let us try the opposite side just by the bank. The water is deep and dark, and if one is there he will be a big one. You see that I now stoop well down, as much out of sight as possible, when I cast, because from here I am more noticeable to the fish opposite than to the one we have just missed (see "Vision of Trout," p. 88). I have three tries, but no luck. If one is there he is not to be tempted. We will try our first friend again. I can stand upright again, being almost directly behind him.

I dry my line and fly by three preliminary switches, and again the fly alights just above the opening and floats down, but this time I get no notice at all from the trout. Once more—failure again! Well, as I don't like to leave a rising fish, we will try another fly, and this time one of a warmer tint. Often it is a good plan, when the fish have not started really feeding on the fly of yesterday, to try a fly with red hackles. So you see this fly in my cap that I am going to use; it is called the Red Quill. It has double starling wings, red hackle, and quill body. I now press the spear of the rod into the turf again, and my hands are free. You see these small but sharp scissors in my knife, which I have secured by a chain and keep in my right-hand coat pocket; I snip off the gut with them close to the eye of the hook, cutting the knot if possible, and, after clearing out the gut from the eye of the hook with the pricker in the knife, stick the fly into my cap, just where you see two or three more flies of the same colour. I place the end of the gut in my mouth to soften while I detach the Red Quill by taking it firmly between the finger and thumb, and by working it gently, it readily comes free from the rough material of my cap. I now slip the end of the softened gut through the eye of the fly, passing it round the cast above the eye in an overhand knot. I then draw this knot taut, and by

pulling on the cast bring this overhand knot close to the eye of the fly. I have used as small an end as possible, which I now cut off.* The Red Quill fly must now be oiled as before. We are now ready again. The scissors of the knife are now closed, it and the oil box are placed in my pocket, and I take the rod, lift the spear out of the ground, get my length, and cast again. Now watch !

Netting the Fish

There ! He has risen, you see, and now, by a slight upward movement of my hand, I have hooked the trout, and before he has time to realize what is the matter I have drawn him below and away from the dangerous vicinity of the weeds. See ! how he fights to get back to his retreat, but it is no good. Now he is trying to bore down into that dark hole ; there may be danger there, so I keep him well up. I have plenty of water, and by a firm but gentle opposition, I check every rush he makes, keeping my rod well up, and finally bring my prize well below the unfished water. My left hand is winding up the reel, and the ever-shortening line is bringing him nearer and nearer. Note the end of the rod ; it is well up, and the bend is nearly always the same, for the line must never be slack after the fish is hooked, and the necessary strain is achieved by the delicacy of the grip of the hand which holds the rod. By careful play I have at last beaten him, and the line is short enough to make the landing-net available, so my left hand leaves the reel and steals to the net ; it is lifted out of its ring and flicked out to its full length, and then, gently stooping, I bring the rod well back and steer the fish slowly towards the net, which you see I hold diagonally, well under the water, keeping it quite stationary until the trout

* For further particulars of this and other kinds of knots see Chapters VII. and XVI.

is above it. Then, by a steady lift, I have the beauty secure, and carry him up the bank.

Once more my spear is used, my rod is safe, and my disengaged right hand grasps the fish below the gills, the thumb and forefinger seeking the gill opening, leaving my left to kill and unhook my fish. Notice how well hooked he is—fairly back in the lower part of the tongue. Here again let me remind you of the advantage in the dry fly method. As you now know, the fish takes the fly in most cases when he sees it coming towards him from up-stream ; when, therefore, you are fishing below him, the hook, as a natural consequence, is pulled into his jaw, as in this case, instead of being jerked out of his mouth, as when fishing above him, and this shows that the chance of hooking a rising fish by the up-stream method is infinitely greater than when wet fly fishing down-stream.

It is a good fish and well above the size limit, so it will go into the creel ; but how are we to kill it ? When a trout exceeds half a pound the most merciful and cleanest method of administering the *coup de grâce* is to give it a smart tap on the top of the head. For this purpose a " priest " is usually carried. My priest forms the lower end of my small fly net.* Here it is, its end conveniently protruding from my creel. The fish is now *hors de combat,* and we can take the fly out of its mouth and drop the fish into the creel.

I therefore open the file (for sharpening the points of flies, etc.) contained in my knife, the end of the file being a disgorger having a lancet face on the lower side ; with this I lance the tongue, and by a gentle pressure of this disgorger on the bend of the hook, the gut being held tight by the forefinger on the file, I instantly free the hook without injuring the fly by any rough pressure on the wings, etc.

* For particulars as to fly-net, and the knife, see final chapter.

Netting a Fish.

1.—Netting a fish. The first attempt fails as the rod is not held sufficiently back and the fisherman cannot bring his fish over his net.

2.—The fish is scared and bolts up stream.

3.—A jump is made to a rock and the fish again brought to the net.

4.—This time the rod is held well back and the fish easily netted.

It is, however, more or less soiled by the slime from the trout's mouth, so I cast it down-stream and pull it through the water once or twice, and thus wash it. A few flicks overhead, and it is once more dry and fit for work.

It will be advisable here to say a few words as to the correct method of netting a fish. A fish should always be regarded as lightly hooked, and the greatest caution should be shown in playing him until he is safely inside your landing net, the object being—first to tire him, and then at the critical moment, when he has exhausted himself, and before he has time to recover, to draw him quietly into the net. The fisherman should show himself as little as possible, and keep the net down below the surface of the water until the fish is well over it.

I was lucky enough to be able to obtain some photographs of a friend of mine when playing and landing a trout on one of the delightful streams belonging to the Lake Vyrnwy Hotel.* You will notice in Figs. 1 and 2, Plate II., that he is standing on a large rock, and that he has hooked a fish. Thinking he had tired his fish out, he attempted to land it without drawing his rod sufficiently back over his shoulder, and, although it will be seen that he has knelt down and extended his net as far as possible, he has failed in drawing the fish within its reach, and has only succeeded in frightening it into another run for freedom. Luckily it was well hooked, and my friend, by jumping from the big rock on to the smaller one (see Figs. 3 and 4, Plate II.), and by altering his method and bringing his rod back well over his shoulder, has been able to draw the fish within easy reach and finally succeeds in landing it.

We will now try the bank again on the further side. There is still no rise, but a fish, and a good one, should be

* One of the most charming and delightful fishing resorts in the world.

there. Take the rod in your hand, keep as low as you can, and try a cast.

Don't be nervous. Imagine that you are casting your fly on the lawn, and look at the water where you wish to cast—close by that root on the other side—and take plenty of time. It is not a matter of life and death, and if you do make a bad cast and frighten the fish there are plenty more just above. Steady! You are forgetting your lessons in the excitement of the moment; you made your forward cast too soon, before your line had straightened itself behind you, and the fly has fallen but half-way to the spot you wished to reach.* Try again. Dry the fly well and let your pause be longer after you have switched the fly back—so—pause. Now cast. Well done! A good straight line, and the fly has fallen lightly. Let your left hand fall at once on the reel, and as the line comes back with the stream, reel up for a bit. Don't let your hand leave the reel; raise your rod a little as the line comes still further back. Look out! Strike! Steady! You have him; Bring him out from the bank and down-stream. Dear! dear! By dropping the point of your rod you slackened your line and you have allowed him to get into the weeds. Keep a steady strain on the rod; luckily he is only in the lower end of the weeds, and we shall perhaps get him out as he is beginning to struggle! Steady and firm. There he comes! He is free again, and exhausted. Reel in with your left hand—easy; let him go a little if he makes a rush, and then reel in again. Keep at him. Keep the point of your rod higher. That's better. The net is all ready; bring him in slowly and quietly toward it.

There, I have him for you, and have given him the *coup de grâce*. Quite a beauty. Well done! Your first fish and eleven ounces if he is a penny-weight. The barb is in

* See instructions, page 155.

his lip and we do not want a disgorger. It is soon out of his mouth, and we will now weigh him. Thirteen ounces. Quite a good fish.

Now remember this axiom: "Never take your eye off the fly when it is on the water." In this case you took your eye away from the fish when it was hooked, in order to guide your hand to the reel, and you dropped the point of the rod and slackened the line, and as a consequence the fish got into the weeds.

A Taut Line

A sporting wish to a person about to fish is that he may have a "taut" or a "tight" line, and this wish may be supplemented by the hope that he may keep it so.

A tight line is a necessity after any fish is hooked and until the fish is safely creeled, and for this reason—the barb of the hook does not in many instances penetrate the fleshy part of the trout or salmon's mouth, the point being merely fixed in the skin or bone of its jaw, etc. When a fish is hooked it naturally endeavours to extricate the hook which is galling its mouth and depriving it of its freedom, and for this purpose it employs its tongue to displace the fly when the hook is not firmly in the flesh. So long therefore as a strain is kept on the line—that is as long as the rod point is kept well up and the line taut between it and the fish, its endeavours to thus obtain its freedom are frustrated. It is only when a momentary slackening of the line occurs through the rod point being lowered, or the slack of the line not being taken in with sufficient speed as the fish runs towards the fisherman, that this opportunity occurs. It will be frequently noticed, after a fish is safely netted, that the fly has left the mouth, the reason being, of course, that the first slackening of the line which has occurred since it was hooked has been after the fish was

in the net, the fish only then being able to extricate the hook. When you dropped your rod point just now, the trout, not being able to free its mouth of the hook, was yet nearly successful in gaining its freedom by being able to get into the weeds.*

On page 209 of Mr. Halford's latest work he suggests that when a fish is hooked among weeds the line should be slackened, in order that the trout may not be frightened into the weeds surrounding him, and the illustration between a trout and a driven pig is then used. This simile is not a good one, however, because while the driver can afford to slacken the line holding the pig—it being securely fastened, so that if piggy goes the wrong way he can be hauled back—the fisherman cannot afford to slacken his line, because it is not fastened to the trout, and, in two cases out of five, a slack line will mean losing the fish.

In order to keep these trout we have caught and your creel or fishing-bag sweet, it is a very good plan, if you have no dry hay, to gather a few leaves of the wild thyme or mint which you see growing by the water-side, and put them with the trout ; it abates the fly nuisance. If you wish to send your fish to your friends, the best packing is something which is dry—dry hay for choice—and always remember that the creel or fish-bag should invariably be well washed and hung up to dry every night when the trout are taken out.

The Rise and its Advantages

While you have been creeling your fish you did not see that rise just above. Look ! Ah ! You saw it that time, and now you know what you have to look out for when I tell you to watch for a rise.

Now a few words as to the rise. It does not follow that

* For instructions on playing a fish, etc., see p. 53.

the commotion caused by a rise bears any relative proportion to the fish making it, and " the bigger the fish the more gentle the rise " is almost an axiom. The reasons for this are simple. The dignified assurance with which a big trout rises at a floating fly is due, not only to his greater experience, but to the fact that he is more often in the deeper and more slowly running portions of the stream; and the floating fly therefore comes into his ken and towards his station slowly, and permits of a well-regulated and leisurely approach.

His smaller brother, on the other hand, is more often found in the shallow and rapidly running portions of the stream; hence, not only from the greater rapidity with which a floating fly will travel, but from the uncertainty of a lesser experience, and possibly from having a keener appetite, he will be galvanised into a more impulsive action when taking the fly. This rush will of necessity disturb the surface more, and make it appear a more important rise, than will the self-controlled action of the older or bigger fish.

See there again, under the bank in the deep water, about thirty yards higher up. Just a dimple, no more. As there are no Red Quill on the water, we will now go back to the Blue Quill. We can dispense with the butterfly-net, which is closed in three seconds, and placed in the fishing-creel ready for use when required.

Fishing the Rise

We can now fish the rise, for we know where certain feeding fish are by these rises, and also which fly they are apparently taking. There is no necessity to bring experience and knowledge to bear in order to determine the probable position of the trout; we have only to notice the rise, and try for rising fish.

There's a rise again by our bank, just ahead. You can locate the exact place of the rise, which is three feet from the bank, just opposite that sedge. If you do not take some landmark, your eye will follow the ripple as it comes down with the stream, and you will probably cast your fly below the actual position of the fish.

When a trout has risen, the sooner the fly is placed above him the better. His appetite has just been whetted by a tasty morsel—he has probably not yet turned to his former position, and the swirl of the water, his own motion, and the alteration of his position will probably prevent a too analytical scrutiny of the fall and the appearance of the line and fly you present to him.

Take the rod, and when you have found the distance cast the fly lightly, just two feet above the position we have marked. No ! no ! What a mess you have made of it ! You are again forgetting your lessons in your eagerness, and have smashed your line on the water, and probably put the fish down. In making your downward cast, instead of finishing when your forearm was level with the elbow and the rod inclined at an angle of about twenty-two degrees above the horizon, and then lowering your rod as the line travelled forward, you brought your rod right down almost to the water, and consequently the direction of your line was downward instead of horizontal. It's no good trying for that fish again ! Try for the one in the middle that has just risen, and project your line horizontally, so that your fly will fall on the water about two feet above the position at which he last rose. Don't make the back cast too soon ; let the fly get well below the place where the fish rose. A trout will at times let a fly pass, and then turn and follow it down-stream ; and even if the fish does not then take the fly, he would be scared by your lifting your line too soon. Now lift your rod and made another cast. That one is better.

Now look out! Strike! You were too late, and too forcible. It only requires a small upward movement of the forearm and hand to hook the fish so long as your line is straight. Just wait a minute, and give him a rest while you listen to me. The strike depends a great deal on a person's temperament. Some men are always slow, and others quick. An immediate strike will become a habit after a time, but there is always the personal equation which dominates the rapidity of the individual action. The health and condition of the mind and body will always affect even the most experienced fisherman, and an alert, nervous temperament and a straight line are the best factors to ensure success. You will gradually become more proficient in striking when you have had further practice.

If a strike is made when the hand is off the reel and the line is not held in either hand, but runs untouched from the reel to the fly, then the angler is said to have struck from the reel.

In dry fly fishing the art of striking firmly and gently is of the greatest importance. Very little weight can be lifted by an ordinary trout rod, and the strength of the end point of your gut cast will determine what force may be used when striking. Little as may be the pull, however, which the gut can stand, it sometimes happens that the hold of the hook in the mouth of the trout is considerably less. Consequently, for the man whose hand is heavy, striking from the reel is recommended, always provided that the check of the drum and its inertia is not greater than the force applied. With even a slightly resisting check, the pull will be sufficient to drive the hook home into the softer parts of the mouth of the trout. The disadvantage, however, of striking from the reel is that the line is nearly always lengthened, and at a moment when it should, if

possible, be shortened. The trout rises at the fly; the strike is made from the reel, and the impetus and pull thus given to the reel are sufficient to unwind from one to three feet, if not more, of the line. As the trout very frequently comes down-stream towards the angler the moment he feels the hook, the amount of line thus drawn off the reel is an additional tax on the capability of the fisherman to reel up the slack line sufficiently fast to keep a strain on his fish.

The breaking tension of a line must be estimated solely by the strength of its weakest part, and the weakest portion of a fisherman's line is, or should be, the fine end point of his cast. Now, although this gut point may be strong enough to check the rush of the fish, and although the reel, once its inertia is overcome, will not in itself present sufficient resistance to cause a break when striking, yet it must be remembered that, not only has the inertia of the drum of the reel to be overcome, but that the pawl, by which the ratchet wheel of the drum is controlled, presents a far greater resistance to the rotatory action of the drum *as the latter starts* to revolve, than it does when once the reel is revolving. The quicker the rotatory action of the drum the less is the resistance offered by the pawl to its revolutions. As a consequence when a fisherman strikes at a rising fish from the reel, he invariably brings at that moment a greater strain on the line than that which occurs while playing his fish, the result frequently being that the gut breaks and the fly is left in the mouth of the trout. This parting of the gut, which in a level fight with the trout, *appears* capable of resisting a far greater strain than the effort used in striking, is regarded as inexplicable by many fishermen, and it is almost better therefore, when using the modern reel, not to strike from the reel, but to hold the line lightly between the finger and thumb of the left hand.

In order to prevent such accidents, to overcome the inertia and to prevent the initial dead check of the pawl when striking from the reel, I am applying for the patent rights of a new make of dry fly reel, in which the resistance offered by inertia is minimized, and an entirely new method adopted of regulating the rotation of the drum. This mechanism acts automatically, but can be so regulated that the tension of the gut when striking from the reel cannot reach the breaking point, while in no degree delaying the effect of the strike.*

Keep Your Eye on the Fly

You must give your absolute and undivided attention to your floating fly. Every angler knows how many chances of striking a good fish have been lost by a momentary lapse from this vigil. The one rise of a heavy fish at your fly may be missed and the fly rejected during the momentary glance aside at the opalescent gleam of a kingfisher, the metallic brilliance of a dragon-fly, a cluster of wild roses, or at any of the thousand delights of the trout stream. It is, however, only when your fly is on the water that this vigilance is imperative, and the fisherman has practically every other moment of the long and delicious summer day in which to enjoy the loveliness of his surroundings. No patience is required in observing this pleasing vigilance. The fascinating expectation of an answering rise to your scientific and delicate cast will be as strong and inspiring during the final cast of your day's fishing as it was during the first cast. It is this absorbing pleasure of looking for and anticipating immediate action during the whole length of an innings lasting practically from morning till night which constitutes one of the principal charms of dry fly fishing, and

* I deal further with other faults in the present construction of reels when discussing the spinning reel in the final chapter of this book.

places it so far above wet fly fishing down-stream, or, in my opinion, any other sport.

The difference between the two methods, fishing up and fishing down, may be compared to the intellectual pleasure and anticipation of the sportsman during every moment of a long and arduous day in September when shooting over well-trained pointers or setters, and the jaded indifference of the gunner who strides along, with his principal sense, sight—after the first few hours—used solely to keep him in line and out of ditches, etc., and who is suddenly aroused and jerked back to the realities of life by the nerve-jarring rush of the birds he has chanced to kick up.

A Fighting Fish

Now watch me carefully once more. The fish you put down are again rising, and I am going to try for the big fellow right under the bank. He has shifted in quite close, so I shall hit that grass above him with my fly, and let it fall into the water and float down quite close to the edge. See, I have done so, and there it comes, now sailing outward with a little sweep, and now sidling quite close in to the bank and almost stationary. There! what did I tell you? I have him, and this time I am into a good fish. You noticed how I dropped the point of my rod when he jumped? There he goes again. What a fighter! Now he is going for those weeds down-stream. Observe the tug as I check him. He has the stream to help him, but I must hold him up, for if he gets into the weeds we shall lose him for a certainty. I have beaten him, I think. No, not I. Look how he clears the water and goes again to the bank. He's all right there, for you can see that the bottom is gravel and there are no weeds or snags. Now to get in a little line. Steady does it. No, he is off again down to the weeds. How the reel screams! and the rod—look at it—bent nearly double.

I have still all my work to do to keep him from those weeds. Ah! he is beaten at last, and now I can get some of the line in on the reel as I follow him down-stream. A little more—that's it; now take this landing-net, crouch down, as much out of sight as you can, and hold the net slanting well in the water, between the trout and myself. I shall draw him over and into it, and when I say "Lift," do so with both hands. "Lift!" Well done! Now bring him up the bank, and let's have a look at him. What a beauty! Are not these crimson spots lovely? I smite him well back on the head with my priest again. Notice how well this Blue Quill had him. We will weigh him; and see, he is just over one-and-a-half pounds, and in good condition. We will put him with the others, but first add a few more leaves of thyme as a fitting tribute to his prowess, and while we fill our pipes I will give you a hint as to your best action when dealing with a jumping fish. Before doing so I will just drift the Blue Quill in the water to wash off the slime, and then press it with my handkerchief and let it dry.

A Jumping Fish

The reason I twice lowered the point of my rod when the fish jumped was in order to slacken the line.

You will often see a good fighting trout throw himself out of the water in his efforts to escape. Frequently this is a deliberate attempt to break the line by a blow of his tail. The general practice is to drop the point of the rod instantly, but I consider that this is not always the soundest policy. The action of the rod must be influenced by the direction in which a fish is moving when he breaks water. If the fish springs straight up in the air, or in any direction away from you, then lower your rod immediately. If, however, as sometimes happens (it has to me on several occasions), the fish is heading more or less toward you at

the time he leaves the water, you should continue to keep the line fairly taut, as this slight strain will keep the head of the fish towards you and prevent his tail coming forward and striking against your line ; it will also prevent the fly loosening in his mouth. If ever a delicate hold on the rod be required, it is at this moment.

In Plate III., a taut line will keep his head toward you, the hook fast in his mouth, and the line clear of his tail.

In Plate IV., by slackening the line at once, the fish will get no purchase if his tail does strike the line, while the weight of the line will keep the hook embedded in his mouth as the fish moves away from you.

In both cases just now, as you could see, the trout was heading away from me and up-stream, so I promptly lowered my rod and kept my line clear of his tail. The lowering of the point of the rod when the fish is heading as in Plate III., may be just as dangerous as not lowering the point when the fish is in such a position as Plate IV., and for the following reason : Lowering the rod slackens the line and releases the strain on the hook—a most risky proceeding, for if the fish happens to be lightly hooked on some bony portion of the mouth, the toothed tongue of the trout, which is constantly endeavouring to shift the fly when in its mouth, will at once get the opportunity it requires, and the fly will be rubbed or torn away from its hold. This latter position, however, is the more common one, and always lowering the rod is better than always keeping it up. The best advice I can give is always to lower the point when there is a probability of the fish striking the line with his tail ; but it must be evident that if the trout, as in Plate III., is likely to throw a somersault so as to bring its tail down between its head and the fisherman, this somersault will be all the more easily executed if the line is slackened.

PLATE III.

A JUMPING FISH.

DON'T LOWER THE POINT OF ROD, BUT KEEP A VERY DELICATE PULL ON THE FISH.

Copyright.]

PLATE IV.

A JUMPING FISH

DROP POINT OF ROD.

Copyright.]

By this time the fly is dry, and we will just touch it with a little oil. We must go up-stream a bit, as our big fight has put down the fish here for a time. There, you saw the rise. A feeding fish just ahead and close to our own bank! Get well down to the water and use a shorter line, and you should get him. That's low enough. Remember the grass and bushes behind you ; make certain to throw your fly well above the fish, and don't lift your fly too soon in your next cast ; let it float well down behind the fish before you make your back cast. Yes, that's right ; you threw your fly well. With regard to getting your line in, you should either gather in your line with your left hand as it comes back to you on the water or else reel it in, keeping the point of the rod down the whole time. It really means this—that if you are casting to a special rising fish it is not necessary to let your fly come down more than six or eight feet below the spot at which it rises, and consequently you can take up all the line that is required in one outward movement of the left hand, then make your cast over again at the same fish.

When you are fishing the stream use only a moderate length of line ; keep well out of sight of any fish which may be lying within the radius of your cast, and do not try for a fish at a distance before searching the intermediate water. Let your fly float down stream for about ten feet for each cast, for this will not necessitate your reeling up. Should you, however, decide to make longer casts, and let your line float on the water for a longer time, reel up your line at first, and then gather in with the left hand as before, ere you make your fresh cast.

Now cast again to the same fish ; don't take your eye off the fly, keep your rod point down, and gather in as the fly comes back towards you. Now the fly has passed the spot where the trout rose, and as the latter may follow the

fly down-stream, keep it on the water. Don't take your eye off the fly. Strike! You have him! Reel up and bring him down, and keep him well away from the bank at your feet; don't let him come in under you if you can help it. He's a small fish, but plucky. Well done! Here's the landing-net; you must net him yourself. No, your line is too long to do so yet; reel up a little more line first —not too much, or you will be unable to bring your rod backward over your shoulder.* Now bring your rod and arm vertically backward over your shoulder and draw the fish toward the net; lift your net and you have him. Well done again: but, you see, as he is only just over the limit, and as it is always better to err on the right than on the wrong side, I think we will put him back, and he will have a chance to grow into a bigger fish.

Undersized Fish

When a rule as to the size and weight of a creelable fish is enjoined on any water, I think most fishermen consider it better to return to the water any fish the size or weight of which questionably approaches this limit.

The keeping of undersized fish when they have been injured is, and must continue to remain, a very delicate problem. Whatever may be the rules governing any water, a trout foul hooked in the eye for instance, should not in my opinion be returned to the water.

Handling a Trout

If proper care be used while extracting the hook from the mouth of undersized trout, no injury should be inflicted from which the fish will not speedily recover if returned at once to the water. The injury done to fish by the handling they undergo before they are returned to the water,

* See page 27, re netting.

especially in those waters where trout are plentiful, and where the fisherman is certain to have to return a good number, may be minimized if a white cotton glove be worn on the left hand, and if before the fish is handled this glove is wetted—holding the hand under the net when it is withdrawn from the water is the most convenient method. By adopting this precaution the skin temperature of the hand is immediately lowered, and the—in my opinion—disastrous effects of scalding the mucus off the trout, mentioned on page 125 of this book, are avoided.

When fishing, if it be seen that the size of a fish hooked is below that which the fisherman wishes to retain, it is a good plan to relax the pull of the rod and line altogether, and in four cases out of five it will be found that the fish will be able to quickly free itself from the hook. The advantages of such a method are—first, that one avoids handling and hurting this delicate fish,—secondly, it is a cleaner and better method of getting rid of an undersized trout—and in the third place, the fly is less likely to be damaged than when it is liberated by the hand.

The above advice emphasizes the danger of relaxing the line when the escape of the trout is not desired. A taut line should be the object aimed at by all fishermen after the strike is made.

Takable Trout

Stream trout, in my opinion, should not be killed under the age of three years.

The increase in the weight and length of trout varies considerably, a four-year-old trout on the upper waters of the Dart being no larger than a small-sized two-year-old fish on the Itchen. The principal advantages or disadvantages of each season on the average growth of each year's stock of trout should be considered, and the limit

imposed on any water should vary in accordance with the condition of its three-year-old fish. The limit should not, I think, be as regards weight or size, but rather as regards the age of the fish, either a three-year-old or a four-year-old fish being creelable, as the case may be. Thus, if the three-year-old fish of a certain year ran from ¾ lb. to well over 1 lb.—the limit should be ¾ lb., the limit to be determined by the length. It should not be necessary to weigh such fish.

When a weight limit is enforced, however, a small muslin bag should be carried, into which, after it has been wetted, the trout can be dropped, and then weighed on a pocket spring balance, but even this method causes prejudicial handling and a longer detention from the water. If then, the owners of the water, or the Committee of the Fishing Club, would give a few minutes' consideration to the probable length attained by their three-year-old fish each year, and select a size covering the greater number of such three-year-old fish, they would, while preventing the two-year-old fish from being killed, give themselves, or their friends, or members, better sport—prevent the appearance of so many discoloured fish, and thin out the fish of three years' growth whose presence is least desired, *i.e.*, those fish whose growth shows them to be of weaker character than the rest of their own year's hatch.

Some time ago, when designing the first "Fred. G. Shaw" rod—I instructed Messrs. Hardy Bros. to make the lower whippings of the butt-joint exactly one inch apart, and to number them from one upward to fifteen. If then the limit be one of size, the fish—directly it is lifted from the water—can be held up by the wetted, gloved hand, to the marking on the rod, and if found to be short of the limit can be returned to the water without delay.

Unless great care in the handling of a ¾ lb. trout be observed, it is far better, I consider, that it should be creeled

than that it should be returned, for the injury to such a fish which follows scalding from injudicious handling, tends to create a black or discoloured fish, and predisposes the trout to the attacks of fungus, see page 124.

Let me impress upon the novice that he should have due consideration for the rights of the owners, his fellow-fishermen, the trout, and the stream. Give them all a chance. Never take undersized trout; never make a boast about big takes of trout. Never be discouraged. If the fish are small, put on the finest tackle. Every day on which you fish you will most certainly add to your knowledge and skill. Although the fish may be untakable and your luck villainous, your fortune will turn. The apparently worst day may before it closes produce the biggest fish. You will find as your skill increases that the pleasure of netting a fish you have beaten is much greater than killing it and carrying it home.

The Broken Hook

Now try that rise on the other side. Keep well down and see that your fly is clean and dry before casting. Why, you have risen two fish and touched them both! Allow me to look at that fly. Ah! I thought so. Now feel the point of your hook, and you will find that it has become blunted, perhaps from having been carelessly broken out of the last fish, or maybe from catching it in that bough a minute ago.

The fine splitting file on the disgorger in my knife now becomes useful. Two or three applications of the file to the point of the hook, and it has as fine a needle point as ever. It does not take more than five seconds to sharpen the point of a hook. It renews the usefulness of the fly, and saves time; therefore, always carry a file, as it may be that later in the day the hook of your last taking

fly has become blunted, and if you have no file you will most likely lose your fish and spoil the rest of your day's sport.

Now fish up that run, beginning where you saw the rise in the pool below it. Cast your fly just where the rush of the stream begins to lessen, and let it float well down. Strike. Well done! Bring the fish down into the pool, so as not to frighten the others in the stream above. Keep him out of that dark deep bend, where the blackberry-bushes dip into the stream. That's right: don't touch your net until you have beaten him. Shorten your line a bit more, and now use your net; stoop down as much as you can, so as to keep out of sight, not only of the fish on your line, but of others which may have followed him down. Well done! Give me the fish and dry your fly again, and try the run right up from where you caught your last. Never mind looking for a rise: there are sure to be fish there. Well done again! and a good one, but you struck with your arm and shoulder, and have broken your cast. Now quickly: we must not lose time while the fish are taking so freely. Let me see your cast. Yes, you have broken off the lower point, so I place about two inches of the end of the cast in my mouth to soften. You see this cast-box; it has some slightly moist white flannel in one compartment, in which have been lying a spare cast, and some fine points. I take out a point, look at it with my watchmaker's glass in my eye. Yes, it is all right—smooth and free from glints. So I pass it through my lips, close the box again, and, taking the point I have selected, make an overhand knot in the extreme end. I take the broken end out of my mouth, run it through the overhand knot, and make another knot of the same kind in the end of it, *only enclosing the gut point in this knot.** I draw both

* See Diagram 7, p. 121.

overhand knots firmly but *completely* taut. Each knot now encloses the gut which has formed the other knot. I draw the two knots firmly together by pulling the cast and the point, and, taking out my knife, I open the scissors and snip off each end fairly close. Place this quite new Blue Quill, which I have taken out of my fly-box, on the end of the point, and oil it carefully.

The Fly-Retriever

Now continue to fish the run right up beyond the ripple at its head. Stop! You have caught your fly in these overhanging branches. Do not attempt to jerk or forcibly pull it clear. Drag it very gently and steadily toward you. In most cases a fly will come clear by a very gentle pull, but if it catches while thus pulling it, it may be only in a leaf, therefore point your rod directly towards it and increase the strength of the pull. If it still refuses to budge, and you can reach the twig with the point of the rod, if you have no fly-retriever with you, reel right up until the point of the rod touches the fly, and then gently twist the rod round to the right or left. This very frequently liberates the fly, but force must not be used. If you cannot reach the fly, pull on the line, still pointing the rod towards the fly, until the fly either tears itself away or the weakest portion of your gut parts. You may probably lose your fly, but you have no alternative. It is inadvisable to climb a tree in waders. They suffer at times, and a particularly cold and unpleasant reminder of this fact will follow your re-entering the water.

I have however in my creel a most excellent fly-retriever designed by one of my clients, the protection for which I have obtained. I place this on the end of my rod, and fix it above the twig on which the fly has caught. A slight pull on the line attached to this fly-retriever and your

fly comes fluttering down on the twig on which it was held.*

A Big Fish.

Start again at the bottom of the run. Ah, I thought so! You are into a big one this time. Reel up! reel up! Walk back, man! Keep your point up and line taut, or you will lose him. Keep him out of the dark corner "an you love me." Steady! drop your point if he leaves the water as he goes up-stream again. There! you have him at last, after a splendid fight. Why, you have beaten my fish. Let us see! One pound nine ounces, and in every respect a beauty. If you take my advice you will send him up to London by this night's train to your taxidermist. Your first big fish is always remembered with the greatest pleasure, and, if set up, is a trophy of which you will always be proud.

* For further particulars of this fly-retriever, see the final chapter of this book.

CHAPTER III

A DAY'S FISHING (*continued*).

The Luncheon Hour—A consideration of the effectiveness of the dry fly—Rising water and its effect on trout—Method of manipulating the line—Hand-lining—Water weeds and Trout—The left hand and the reel—Something to remember—The selection of the fly.

As the rise has now stopped and the sun is very hot, we may as well take our luncheon in the grateful shade of this willow, and resume our chat as regards dry fly fishing.

After fishing experiences embracing nearly every portion of both hemispheres, I am confident that at certain times and seasons the dry fly can be used with success on any water which harbours a fish whose food partly consists of any of the forms of the water insect which attains, as one stage of its existence, a flying state, and hence the importance of learning how to use a dry fly. Even amid the brawling cascades of a Norwegian foss there will be found places where the dry fly is deadly. I remember on one such stream, which tumbles some 1,000 feet down the side of the precipices enclosing Vadheim, taking over twenty good trout with a single dry fly, as I clambered up from pool to pool to reach the lake from which the stream issues. I have used the dry fly for perch in Australia ; for the " yellow fish " (the Mahseer) of South Africa ; for trout in the Scottish lakes and their brawling tributaries ; on the Swedish lakes and rivers ; in Germany on the lovely Wutach ; in the Black Forest and in the Austrian Tyrol ; in the chalk streams of Normandy ; on Lake Superior, amid the Rockies, in

Vancouver Island, etc., and my experience tells me that in all trout streams wherever water insects assume a flying condition the dry fly can, at certain times and in certain places, be used with the greatest success. I don't believe that any trout stream can be regarded solely as a wet fly stream.

As an instance of this, I remember that, during a summer now long past, several well-known wet fly fishermen, stopping at an hotel in Wales, had for some weeks given up all attempts to catch trout, and, happening to arrive at the time, I converted every fisherman there to the usefulness of the dry fly method by killing fourteen fine fish on my first afternoon, and seventeen as good fish the following day.

On the lovely little Sid, in Devonshire, just as on the waters of the Deveron, on the Otter as on the waters of the Welsh Wye, on the Lambourne as on the waters of the Coquet, or the Eden, or the Derbyshire Wye, the dry fly will be as effective in June, July, and August as is the wet fly in March and April. It is on the correct choice of either method that the greatest success depends. When the trout are being taken freely by the dry fly method, the wet fly fishermen would be well advised to adopt that method, and *vice versâ*. For dead or perfectly smooth water, especially later in the year, the dry fly method of fishing is without doubt the better.

But if sport is wanted, and opportunities of fishing are few, it would be a mistake for the dry fly man to reel up his line when a temporary thickness of the water shuts out his fly from the ken of the fish, and so prevents his fishing with a dry fly. If the rain has been a warm one the trout are sure to be feeding toward the bottom of the stream, and probably on drifting matter, such as the drowned sub-imago, etc. It is much wiser, therefore, for the angler to put on a wet fly cast, and, sinking his flies well below the surface,

PLATE V.

MY DOG AND MY FISH.

A MORNING'S CATCH ON THE TEST.

to fish his way down-stream ; he is very likely to pick up some good fish, instead of losing half, or perhaps more, of his precious day's fishing.

Rising Water and Non-Rising Fish

Both with salmon and trout fishing it is well to remember that fish will cease to rise at a fly or to take the lure when the water is rising to any appreciable extent. This fact will be particularly noticeable when dry fly fishing for trout, and the first intimation that the fisherman receives as to the rise in the river will be that the fish themselves cease to rise. I have noticed at times that for the first few minutes of a rise in the water of a stream the fish seem to be more lively, but as the water continues to increase in volume they will invariably cease rising. I have frequently, however, evaded the misfortune of a temporary rise of water on one stream by motoring down stream, or to some other water not thus affected. Fishing not long since on the Touche in France, which runs into the sea at Trouville, I noticed about three o'clock that the fish suddenly ceased to rise. I then looked carefully at the water, and saw that it was rising owing to a thunderstorm which had taken place up the valley in which I was fishing. My host having his motor car at hand, on my recommendation we ceased fishing and motored down some forty miles nearer to Trouville, where we continued to fish until dinner time with great success, the rise in the water not having by that time reached us.

Some rivers in the Northern Island of New Zealand run through argillaceous or calcareous country, and when rain occurs these rivers become discoloured, and fishing is rendered impracticable. It is quite possible to continue fishing by going a few miles away to rivers whose course runs through a different geological formation.

One of the characteristic signs of fish ceasing to rise or coming on the rise under normal conditions, is that one or two will throw themselves out of the water. I have never solved the question as to why they do this, but when the fish have not been rising and I suddenly see a medium sized fish throw itself out of the water, I expect, and nearly always find, that a rise is about to commence. On the contrary, if, during a good rise, one or two fish are seen to throw themselves out of the water, it is nearly certain that the rise will soon cease.

Manipulating and Shooting the Line

As you have already experienced difficulty in managing your slack line, and in manipulating your rod and line after the fish is hooked, I will utilize our luncheon hour by giving you a few hints on this subject.

There are at least three sound and convenient methods of gathering in the slack line as it comes back towards the fisherman when fishing out a dry fly cast up-stream.

When the fly is only allowed to travel some eight or nine feet down-stream after it has alighted on the water, the rod should not be raised, but as the current brings the line back, and as the line is beginning to hang almost vertically from the rod point to the water, the left hand thumb or forefinger should gather in this slack line by an outward movement from the rod, the line being allowed to slip smoothly round the thumb or forefinger until the left arm is extended outward from the side. Should the back cast then require to be made the line should be nipped between the finger and thumb and held firmly, and the back and forward cast should then be made, but as the rod straightens at the end of the forward and downward action, the finger and thumb must release the line, which will then, if the cast be perfectly made, be pulled out through the rings by the forward

impetus of the line. This forward extension of the gathered in slack line is known as "shooting." It is evident that should a fish rise at the fly while the line is being thus taken in, the finger and thumb would nip the line as the strike is made. The rod having been held low and the slack line taken in by the hand, the tension will come on the hook before the rod is more than seventy degrees above the horizon, and if the fish is struck this backward action of the rod is continued and absorbs the slack line, as it is then released by the finger and thumb of the left hand, which latter hand, seeking the reel, commences to reel in the line as the fish comes down-stream.

If the strike be properly made and misses the fish, the line will extend itself backward as in the back cast, and should be brought forward again as in the forward cast, and the slack line—which has been held by the finger and thumb—is released and allowed to shoot.

The second method, when the fly has to float from ten to twenty or more feet down-stream, is also to keep the rod point down, but to take up the slack line between the rod point and the water by using the reel. It must be evident that the slack can thus be absorbed by the reel until the fly has only a few feet more to float down-stream, when the first method as above described can be adopted.

The third manner, used when fishing out a short cast with a short length of line, is to raise the rod point as the line comes back, and when the back cast has to be made, the rod point is first lowered and the line is gathered in by the hand and the backward and forward cast is then made, the finger and thumb releasing the line at the end of the downward action as usual, etc.

Gathering in the line with the hand, and at the same time raising the rod point, is a common fault. As the line and the fly on the water must not be disturbed, it must be

evident that when the finger and thumb have drawn in as much line as they conveniently can, and when the rod has been also raised to an angle of fifty or sixty degrees, that there must be much slack line still between the rod point and the fly, and therefore if at this juncture a fish rises at the fly and the strike is made, the hand holding the rod will have to be raised and to travel some way behind the head of the fisherman before the line is sufficiently tight to drive the hook into the mouth of the fish. This action brings the rod into a position from which it is practically speaking almost impossible to wind up the slack line—which has been gathered in and which is still held in the left hand—and to keep at the same time that constant and permanent strain on the fish which is so necessary, and the fisherman is obliged, therefore, when this happens, in order to keep the strain of his rod on the fish, to run backward and handline his fish. Even if the fisherman be capable of striking the fish as it rises, the position of the rod will prevent his playing his fish from the reel and he will have to handline.

The first way is the best way.

By fastening the end of the line to a croquet hoop or anything else on the lawn, these three methods can be practised by the reader, and he should gather in the line in the different ways I have described above, taking care not to disturb the line lying on the grass between the rod point and the hoop until the strike be made, etc.

After he has fixed his line to a croquet hoop, he should stand at a distance of eighteen yards from the hoop, his rod held horizontally about three feet from the ground, and having his line extended on the grass. If then he walks towards the hoop, the line will become slack under the point of his rod in exactly the same manner as if it were being brought down-stream towards him after having made his cast up-stream. If instead of fastening the line to a croquet hoop,

a friend will hold it in his hand and as the strike is made walk rapidly towards the striker, the relative value of the above methods will become even more pronounced.

Should the three methods I have suggested thus be practised, it will be found that the first is the best and safest. No *contretemps* can possibly happen.

In the second method the disadvantage is that, if the same distance in the coming cast has to be reached as in the latest cast, some false casts have to be made, during which the line has to be pulled off the reel again before the full length required for the final cast is obtained.

In the third method, which is simply raising the rod when picking up the slack line, should the rod approach the vertical before the fish rises, it will, at the conclusion of the strike, be pointing backward over the shoulder, instead of pointing upward and forward, and the control of the line by the reel may become impossible and handlining will have to be adopted.

In your latest effort at the trout I directed you to raise the point of your rod because we were aiming at a definite fish, and your fly had not to travel for any distance before it had floated below your fish and another cast was advisable, but where you are fishing the stream, that is not casting to a rising fish, it is always best to let your fly come well back down-stream towards you, in order perchance to cover a possible fish which you may not have seen rise. This means, however, taking in a great deal of slack either with your finger and thumb, or on your reel, and of the two the latter is, I think, the better way.

Handlining

"Handlining"—a method of gathering in the line with the hands instead of by the reel—should not be adopted except in cases of unavoidable difficulty, otherwise a slovenly

habit of using the rod and reel will ensue. If the method of handlining is adopted after striking a fish, it has to be continued, and the slack line thus recovered will prove a constant source of danger should it be necessary to follow the trout down-stream and keep him under control. In this respect I venture to disagree with one of our best known authorities, who advises his readers to slacken the line after striking a trout among weeds, and then to handline.

Naturally one would not drag a fish into danger except as a means of keeping it away from a greater danger, but a trout, after being hooked amid the weeds, will in nine out of ten cases dart into the shelter of the weeds surrounding him, and I see little good in relying on the chance of his not doing so. It is only by keeping a constant tension on the line that the fly is in many instances kept in the mouth of the trout. For the slightest slackness of the line frequently permits the trout to use its tongue as a hook extractor and dislodge the fly, and therefore I think that neither slacking your line nor handlining is advisable when once you are fortunate in making a successful strike at a trout.

The writer above quoted advises his readers to turn the fish and walk it down-stream directly it is struck when amid weeds. He claims that this method, if successful, possesses the advantage of keeping the battle from the hitherto undisturbed waters above; but a trout, except it sees the fisherman, or it happens to be feeding at the tail end of a pool, generally runs down stream unless it darts into the weeds, etc. He might also claim that this method of handling a fish takes it away from its retreats and into regions of comparatively speaking unknown security, but it has the demerit of leading the fish downward into weeds —the most dangerous of all manners in which a trout can enter them. It also has the demerit that, unless the trout

happens to see the fisherman and thus be scared into the weeds on its far side, he cannot keep the trout out of the weeds which lie between it and himself, which position, if taken up by the trout, is most dangerous.

It is better, however, to try handlining than to run the risk of losing your fish, and this method has the same advantage as the silent reel, in that the jarring vibrations of the check are absent at a critical moment.

It must be remembered that trout which take advantage of the shelter which is offered by weeds, are better fed and consequently stronger and larger. They are also more approachable, but though this may be to the advantage of the fisherman, yet it is more than counterbalanced by the difficulty of casting to and playing a trout when hooked in a channel amid the weeds. If a trout be rising in one of the narrow channels formed by the stream amid the weeds, the prick and check of the strike will invariably send it into its refuge among them, and, unless this channel be directly above and running towards the fisherman, there must not be the slightest hesitation on his part, drastic measures must be adopted directly his strike is successful. The head of the trout must therefore be kept well up, and, if possible, brought above the weeds by a firm and maintained strain on the line; once the head of the trout can be raised so that it lies on the weeds the struggles of the fish will only serve to bring it over the top of them and toward the net. When handling a big fish in this manner it will make a very great fight, but unless such tactics are adopted it would most certainly be lost with probably a portion of the fisherman's cast.

I have known many fishermen afraid to cast to a fish, assuming that they may be unable to land it, even if they are successful in hooking it. I think however, that this is one of the sporting risks which should always be taken.

It certainly affords me great pleasure when I have captured a fish that has been lying in what I consider to be an almost impossible position.

There are times when a big trout does lose its head, fails to seek the security of its home amid the weeds, and allows itself to be led gently down stream to a place clear of weeds, as suggested by Mr. Halford. I only remember having seen such an occurrence once, and I do not consider it advisable to take the chances of its happening again.

If a big trout be hooked when directly up-stream in such a narrow channel, it should, if possible, be turned down-stream and kept coming down-stream towards the fisherman until clear of the weeds, etc.; but this, again, means drastic and immediate measures before the fish can recover from the surprise of the strike, and great care must be taken, when bringing it down, to keep as much as possible out of sight.

The Left Hand and the Reel

Now I see some signs of the fish beginning to move again, but before we start I think I will give you a few hints as to fixing the reel on the rod.

The traditions handed down from the earliest records of fly fishing, associated as they were with the then only known method, namely, wet fly fishing down-stream, are responsible for the belief which exists in the minds of fishermen of to-day that the handle of the reel must be on the right hand side of the rod, and they have grown to believe that they cannot use their reel unless so fixed, and to think that they cannot use the left hand for winding. They have therefore been in the habit of using the right hand for winding in the line, having of course to change their grasp on the rod when using the right hand for casting with the single-

handed rod, and also when the right hand is uppermost when casting with the double-handed rod.

The following episode will illustrate the difficulty I sometimes experience in getting my clients to even consider the advantages of using the left hand for winding purposes, and of altering the position of the reel on the rod. I was about to coach a military client, whom I will call Colonel O'Brien, in the Spey cast, on my St. John's Wood ground, and as he wanted my advice on his salmon rod he had brought it with him. As I was fixing up a cast and fly, he put his rod together with the reel handles facing to the right—this I noticed after I had fixed the cast and fly to his line—and the following dialogue occurred :—

" Colonel," said I, " do you always fix your reel with the handle on the right hand side ? "

" Sure," said he, " I do."

" And do you prefer to have your right hand uppermost when you are using the salmon rod ? "

" I do," said he.

" Then, Colonel, why don't you have the handle of your reel pointing to the left hand side, so that you can reel up with the left hand, without altering your hold on the rod ? " I enquired.

" Sure," said he, " I never use my left hand for anything."

" What about eating peas, Colonel ? "

" Faith! Are we talking about feeding or fishing ? " he asked, raising his eyebrows.

" Well ! " said I, " Supposing you are loch fishing, or fishing in slackish water, and the fish makes a terrible rush towards you and you have not time to shift your hands, what are you going to do ? "

" Sure," said he, " If I am in a hurry I twist my rod round"; and, saying this, the Colonel illustrated it by twisting the rod round, continuing to hold it with the right

hand uppermost, and bringing the reel over the rod with its handle pointing to the left hand side; then seizing the handle of the reel in his left hand, he began to illustrate how he would wind up the line quickly in such an event.

"Colonel!" I asked, "do you kill many fish like that?"

"Sure," said he, "I kill half of the fish in this way."

"Well, Colonel! which hand are you using now?"

"Begorrah!" said he, after a moment's reflection, "I've been using my left hand all the time and I didn't know it."

Admittedly it may be awkward in the first few attempts to wind the reel with the left hand, when the right hand only has been accustomed to the work, but then a similar awkwardness is experienced whenever we vary an accustomed method of performing any action. Take for example our procedure in putting on any garment, say a coat—if we are accustomed to insert the right arm first into its sleeve, let us instead experiment by introducing the left arm first, and the awkwardness will be at once admitted, but this does not infer that the latter method of putting on the coat is more difficult or that it could not be easily acquired.

A Wrinkle

And now I will show you yet another way of taking a trout before I go home. You can see that not a fish is moving; everything is baking hot. The sub-imago is sheltering amid the grass, and the pupa amid the weeds; both dislike this bright and torrid glare, and while the former is getting ready for his joyous but very brief honeymoon existence, the latter is clinging to his wavy and shadowy retreat, and waiting for the impulse which is to send him, despite all dangers, jigging up towards the surface to loosen the wings which are fretting within his mask.

Do you see that deep hole, right up-stream, where the water glides smoothly by that sun-smitten rock? Well, I am certain that there is at least one trout in its shade, and, therefore, I am going to throw my fly on the rock, and then slowly pull it until it drops off into the deep water. Watch! There, I made no splash with my line, and my fly has alighted just on the edge of the rock, and well in sight of any fish which may be lurking in the cool and delightful depths below. See, I pull it gently, it slides down the rock, tumbles into the water, and floats beautifully down-stream. A little ring spreads out, and dies away. The fly has gone! It is a rise, and I have him. See how he bores down; he has some retreat, possibly a hole at the base of the rock, but out he has to come, and, finally, after a stubborn fight, he, too, goes into my creel. Now take the rod, as I must be getting home. Shorten up the line. No, you are winding the line up too carelessly. Always wind a line firmly on the reel, or you will perhaps at a critical moment be in difficulties owing to the line over-running itself. That's better! The next two or three hours' fishing will be poor; therefore fish the rise if you see one, but also try all the places in which you think it is possible fish may be lying. Alter your fly if the rising fish neglect the one you are now using.

Keep well out of sight, and go gently with my rod, and "Good luck and a taut line to you!"

The Selection of the Fly

The most critical decision of a day's dry fly fishing is that which centres round the selection of the artificial fly. The varieties of the fly to which the fish will rise are many, and the times at which these flies may appear are uncertain and impossible to foresee. There will always be an uncertainty as to size, colouring, or variety of the fly which will

be taken, and indeed which is being taken, at any moment by the fish; there may also be a variation of much importance in the size, colour and appearance of the different hatches of the same family, and to be successful under ordinary circumstances the greatest care should be exercised in determining this point.

Take the May fly as an instance and consider the very great variety in the size, colour and appearance of these ephemeridæ. Each season, nay—each day, nay—each hour of each May fly season, will probably produce a variation in its flying insect, which it would be well for the fisherman to note. I had recently sent to me by Mr. Cummins of Bishop Auckland a sample box of May fly in which there were fifty-eight distinct patterns, and, varied as they were in colour and size, I did not see one which did not recall some specimen of May fly which I have seen and used in the different waters of the Northern Hemisphere.

A May fly of some particular colouring and size may establish a premier position as a lure during any one season in any one district, and yet be almost useless the following year on the same water. It may be that these water insects are *protean in their colouring*, and that their changes of colouring are protective; but of one thing the fisherman may be certain, that no attention can be too great to give to the exact size, colour, etc., of the fly or flies which are to be seen on the water he is fishing. No matter how killing a fly may be at any one minute, a sudden rise of the fish will occur at some other variety of fly during the next moment, and directly the fisherman recognizes that his fly is unnoticed by a rising fish, his rod should be discarded in favour of the fly net, and each floating or flying insect should be captured and carefully examined. Say that I have been fishing with an Olive Quill which has been killing well, and though the fish are still rising, my Olive Quill fails to attract

their attention; I press the spear of my rod into the turf, take my fly net out of my creel and get right down to the waterside. Now comes sailing down a dainty yacht-like ephemeridæ—it floats into my net and is then examined. I find that it is one of a variety known as Blue Dun. Here comes another : it is an Olive. Here again is another !—a Ginger Quill. And another ! a Ginger Quill again. This is good enough. My fly box is opened. My recently captured Ginger Quill is compared with the specimen in it, and a fly similar in size selected. My telescopic net is replaced in my creel, my Olive Quill taken off, the Ginger Quill substituted, and hey presto ! once again I am into a fish. It will be seen, therefore, not only how important it is to have some sort of fly net with which to capture these elusive and delicate flying insects, but also to depend on the information it enables you to obtain as to any hatch of flying insects—and thus to quickly select the right fly to fish with.

The following chapter on these flying insects, their lives, metamorphoses, and appearance, will prove of interest and importance to the fisherman.

CHAPTER IV

Water Insects and the Rise

Description of the Ephemeridæ and other water insects—The Ephemeridæ—The Trichoptera (the Caddis Fly)—The Perlidæ (the Stone Fly)—The Sialidæ (the Alder)—The Diptera—When and where to use these flies—Fly boxes and their use—Flies—The May Fly—On the patterns of Flies—*The Fishing Gazette* and Mr. Val Conson—Mr. R. T. Wickham and the late Mr. David Foster—An interesting theory—The rise—A theory for the rise—The best time to fish—The evening rise—Fly fishing at night—Fishing by moonlight.

With the exception of a few fancy variations, the flies used by the trout fisherman are made to represent as nearly as possible the appearance of the winged stage of certain water insects which are known to the entomologist as : The Ephemeridæ, the Trichoptera, the Perlidæ, the Sialidæ, and the Diptera. In order that the student may be able to tell to which of the above five families the flies he catches in his butterfly-net belong, it will be necessary to remember the following characteristic position of the wings of each family when the fly is alive and at rest.

The Ephemeridæ.—The wings rise upward from the shoulder in vertical planes above the body, generally touching each other as they rise from the body, and when floating down-stream these delicate insects can easily be recognized : their wings are like the sails of a fairy yacht afloat on some dreamland sea (see Plate VI., Figs. 2 and 4).

The Trichoptera.—The wings run backward from the shoulder, and lie alongside the body, meeting, tent-shaped, at their upper edges, and gradually diverging in the posterior direction (see Plate VII., Fig. 4).

THE SIALIDÆ (the Alder).—The wings of the members of this family are carried in a similar manner to those of the Trichoptera, but the family is a smaller one (see Plate VIII., Fig. 4).

THE PERLIDÆ.—The wings are placed in a flat position, running backward from the shoulder in horizontal planes, and crossing or overlapping one another over the body (see Plate VIII., Fig. 2).

THE DIPTERA.—The wings generally, like the Perlidæ, are placed in horizontal planes ; in most cases they do not overlap, but diverge from one another, as in the common housefly.

There are over 200 different species of water beetle, the numerous family of the Notonectidæ, besides the larvæ of the above flies, etc., upon all of which trout exist ; and, therefore, the wet fly fisherman may well imitate other forms of sub-aqueous life.

THE EPHEMERIDÆ

The sub-aqueous existence of one of the Ephemeridæ occupies the greater portion of its life. From the period at which it leaves its egg until it becomes a flying insect it is undergoing a gradual metamorphosis, and, like the Perlidæ, at no time does it assume the real pupal condition—that is, the dormant chrysalis stage—common to the Trichoptera, Sialidæ, and the Diptera.

It should therefore, strictly speaking, only be alluded to as being in a larval condition until it becomes a sub-imago, but for distinction the latter period of its larval condition may be termed pupal. It is at about this latter period that it begins to be of most interest to the fly fisherman, and, with the kind assistance of Mr. Chas. O. Waterhouse, of the South Kensington Museum, I have been able in Plate VI., Figs. 1 and 3, to give two characteristic views of its

appearance just before the sub-imago state. The beautiful illustrations of the larval, pupal and flying stages of the water insects on Plates VI., VII. and VIII. were drawn for me by Mr. Horace Knight, of the Natural History Museum. Fig 1, Plate VI., shows the pupal stage of the larva of the May-fly, *Ephemera vulgata*, twice its natural size. Fig. 3 represents the pupal stage of the larva of *Cloëon rufulum*, a fly resembling the Red Quill. Fig. 2 shows the *Ephemera vulgata* in its flying stage with the wings open. Fig. 4 shows the *Cloëon rufulum* in its flying stage with its wings closed. The larval period of the different Ephemeridæ lasts from one to two years.

There are several varieties of the larvæ, corresponding to the several kinds of Ephemeridæ, and in each the appearance and the habits differ—some crawl, some burrow, and others, again, swim—but in all the varieties the larval appearance alters as they attain full size, and beneath the transparent integument covering their bodies can be discerned the gradual development of the wings, thorax, and legs, which will be used after the metamorphosis to the flying condition (see Plate VI., Figs. 1 and 3).

When the larvæ are fully ready for this change, they leave the haunts in which they have hitherto spent their existence, and swim to the surface. When there the mask-like membrane, under which the wings, etc., have been visible (see Figs. 1 and 3, Plate VI.), splits open, and, supported on this shell as on a raft, the insect gradually frees every part of its body and unfolds its wings. As soon as these wings are dried, and the body is clear of its shell, the sub-imago, as it is now called, flies to the nearest bank, where it shelters itself amid the grasses, leaves, etc. It is commonly known in this state as a dun, and it appears at various times, when the weather is favourable, in the vicinity of the water during a period of from one day to two

FIG. 1.—*Ephemera vulgata* (May-fly), twice natural size, ready to assume its sub-imago or semi-final flying existence. Note the wing as seen under the pupal mask.

FIG. 2.—Flying state of *Ephemera vulgata*.

FIG. 3.—Ephemera, *Cloëon rufulum*, twice natural size, ready to assume its sub-imago existence. Note the wings.

FIG. 4—Ephemeridæ *Cloëon rufulum*, Flying State. Magnified.

or more weeks, flying with the breeze, generally down-stream. In this stage of its life it can be easily recognised by its comparatively heavy, drifting flight, and its dull, semi-opaque appearance. By the aid of a watchmaker's glass, cilia will be seen covering the surface, and forming a fringe to the posterior margin of its wings.

The sub-imago stage of its life, which is very brief in some cases, is finally forsaken when the entire membrane of its body and wings again splits open and is discarded, and the insect then assumes its perfected stage as the imago or spinner.

It is now fully matured and enters into its bridal existence, which lasts but a few days. In this stage it is to be seen in great numbers when the heat is not excessive and during the evening hours. Its wings are now gauzy and its body lighter and more brilliant in colour. It is easily recognised as it soars, floats, and sinks in the ambient summer atmosphere.

The following are the popular names by which some of the forms of the Ephemeridæ are known : Olive Duns, Duns, Blue Duns, Autumn Duns, Blue-Winged Olives, Iron Blue Duns, Red-Quill Duns, Red Spinner, Jenny Spinner, May-fly, March Brown, Iron Blue, etc.

The Trichoptera, or Caddis-fly

These insects, unlike those of the Ephemeridæ and Perlidæ family, undergo a distinct metamorphosis during their sub-aqueous existence.

The Trichoptera may be divided into two families. The larva of one, after leaving its egg, spins a cylindrical sheath round itself (see Plate VII., Fig. 2), which forms its future home, and to which it attaches small stones, sand, wood, etc. ; these cover and mask this case, and at the same time act as ballast. The case thus forms an armour-like

protection against enemies. The larva uses this sheath as a movable residence, and from the open end its head, thorax, and legs protrude and provide the motive power, the weak and maggot-like body (see Plate VII., Fig. 1), being always enclosed and protected by the armour-clad case, which it drags about from place to place. After various enlargements to suit the growing conditions of its body, the larva enters and partially closes the open end of its case; it then commences its pupal existence—*i.e.*, it becomes a chrysalis, and finally, when the chrysalis stage is over, it tears open the *sac* covering which has protected it during the dormant existence. Swimming to the surface, it either supports itself against some floating object or makes its way to the bank. The skin then splits open and the insect enters the flying stage direct (see Plate VII., Fig. 4), the pupal kin being generally left in the water.

The larva of the other family of the Caddis-fly forms its home by spinning a *sac*, like a bag, attaching it to some sheltered spot, and covering it with stones, etc. It leaves this home in search of food, and when the pupal stage approaches, it partially closes the aperture and undergoes a pupal phase similar to the one above described, before it assumes its imago existence. Some well-known forms of the Trichoptera are as follows: The Red Sedge, Silver Sedge, Orange Sedge, Grannom, the Welshman's Button, the Cinnamon-fly, the Sand-fly, etc. In Plate VII. will be seen two exquisite drawings of the larva and the pupa of the Caddis-fly, by Mr. Knight.

Fig. 1 is the larval condition of the Phryganea, one of the Sedge family.

Fig. 2 shows the larval case of this water insect.

Fig. 3 is the pupal stage of the same water insect.

Fig. 4 is its flying stage.

FIG. 1.—The Tricoptera Phryganea (Sedge-Fly), three times natural size. This larva spins a cylindrical tube, and when it reaches maturity closes the end and enters its pupal existence.

FIG. 2.—Caddis Fly. Larva in Sac. Natural Size.

FIG. 3.—The Pupa, three times natural size, ready to tear open its pupal envelope and to enter its imago or perfected flying existence.

FIG. 4.—The Flying Form, Magnified

THE TRICOPTERA, OR CADDIS FLY.

The Perlidæ: The Stone-fly

The sub-aqueous existence of the Perlidæ after leaving its egg and until maturity is reached, consists of a crawling and swimming larval condition lasting several months, during which phase it gradually matures and attains by progressive changes a state ready for metamorphosis. See Plate VIII., Fig. 1. When this is reached it swims to the surface, crawls ashore, attaches itself to stone, rock, or timber, and undergoes a direct metamorphism into its imago existence.

Its appearance at first is delicate and pale, and it appears to have a great difficulty in flying; but its colour soon darkens, and it grows stronger on the wing (see Plate VIII., Fig. 2).

In Plate VIII., Fig. 1 shows the larval stage of the Perlidæ *Nemoura variegata* (Old Joan), magnified about two-and-a-half diameters. The characteristic wings of this water insect are to be seen on either side of its body, and the larva is shown just before it undergoes its metamorphosis. Plate VIII., Fig. 2 shows the mature state of this fly.

The following are some well-known forms of the Perlidæ: Stone-fly, Yellow Sally, etc.

The Sialidæ: The Alder

The sub-aqueous existence of this form of insect life is purely larval.

The eggs are laid by the female Alder on grass, rushes, etc. When the young larva is hatched, it crawls into the water and continues its existence more or less in the shelter of the mud until it is ready for its pupal stage (see Plate VIII., Fig. 3).

It then leaves the water again, and burrows in the earth to pass its pupal existence; it there assumes the condition of chrysalis or pupa. Changing from the pupal to the flying

imago condition within the shelter of this retreat, it crawls to the surface and finally takes flight (see Plate VIII., Fig. 4).

The best known form of this fly is the Alder.

The Diptera, or Two-Winged Fly

The very numerous varieties of this class of insect preclude more than a brief reference to those forms which the fisherman is most likely to copy as artificial flies. These are: The Black Gnat, the Oak-fly, the Spider-fly, the Cow-dung, the Golden Dun, the Hawthorn-fly, and the Claret Smut, sometimes known as the Red Quill Gnat.

The larval and pupal characteristics of these flies differ widely, and the student can do no better than consult entomological works on this and the other families of water insects.

The most common form of this family is the house fly, and this hardly needs illustration, but its larval and pupal stages may be of interest to the reader. See Plate VIII., Figs. 5 and 6.

What sort of Flies to use and When and Where to use them

If possible, the fisherman should determine before he leaves home what flies he may be likely to want when he gets to his water, so that he may be certain of having his box well supplied with those which are likely to be taken by the fish. He should, if possible, find out with which one he should commence his work, for should there be no hatch of flies on, no flies to be seen on the water, and no evidence available on this subject when he arrives there, he will probably lose a great deal of valuable time ere he finds out the particular one which is likely to tempt a trout to rise.

FIG. 1.—Perlidæ, *Nemura variegata*—Small Red Stone-Fly—(Old Joan). 2½ times natural size. The larva is shown just ready for its metamorphosis into its imago or perfected flying existence. Note the wings.

These wings are full sized, but are most delicately packed under their small envelopes, as shown above.

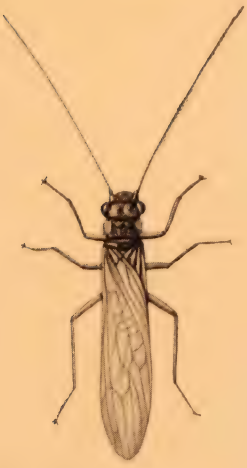

FIG 2.—*Numera variegata.* Flying form of Fig 1. Magnified.

PERLIDÆ.

FIG 3.—*Sialis cutaricus* (Alder Fly). Larval form. Magnified.

FIG 4.—Alder Fly in flying form, twice its natural size.

SIALIDÆ.

FIG. 5.—*Diptera Musca domesticus.* Pupal form of House Fly, four times natural size.

FIG. 6.—Larval form of same, four times natural size.

DIPTERA.

Should he have had no previous experience of the water he proposes to fish, he should endeavour to discover from the owner, or from the keeper of the water, the names of those flies which are hatching out, and to which the trout are rising. Both the *Fishing Gazette* and the *Field*, in their weekly fishing reports, give some indication of the flies which are being taken by the fish. Some idea as to those which are being ordered from that part of the country in which he intends fishing, may be obtained from his fishing tackle people.

The rises of different varieties of fly, however, are extremely uncertain, and all former experience, as well as the latest information from the water, may have to be modified by the circumstances which exist at the moment at which he starts his fishing.

The list of artificial flies on p. 71 may be useful to the dry fly fisherman, when purchasing his fishing outfit, and it will serve as a guide as to the principal varieties of flying insects which are, generally speaking, met with in different parts of Great Britain and at different seasons of the year.

By making enquiries from some local authority, or at the nearest fishing-tackle business, a great deal of trouble and disappointment may be prevented when fishing a stream for the first time.

The beginner should always carry a small fly net, with which to capture, and so examine, the flying insects which he may observe on the water or by the water side. Much useful knowledge will be thus acquired, and his chances of success greatly increased if he is aware from hour to hour as to the flies which he may have to imitate if he desires to catch trout.*

* See the "Ephemeridæ" Fly Net, described in the final chapter.

Fly Boxes

After using nearly every pattern of Fly Box I have come to the conclusion that while it is necessary to have a fair-sized wooden or cardboard case divided into compartments and fitted with celluloid lids, in which to keep a general stock of eyed flies, it is better for field work to have one or two small sized japanned tin fly boxes, each containing from twelve to fifteen compartments. These fly boxes are light, and either one or both can be carried without the slightest inconvenience in the creel or in the pockets of the fisherman. Each compartment of these fly boxes should have a celluloid lid, so that the flies may be always on view ; such compartments should be numbered, and should contain a carefully selected assortment of the flies which are likely to be wanted. On the inside of the lid of the box should be a list of the names of the flies carried, and numbered in accordance with the numerals on the compartments of the box itself.

The advantages of this method of carrying the flies when fishing are many—the beginner will find it to be the best and most expeditious way of acquiring a knowledge of the names of the flying stages in the life of the water insects, and of the imitations which he will have to use when fly fishing.

If, for instance, a novice hears that the Red Quill is being taken on the water he is going to fish, he has only to consult the lid of his fly box, and he will at once see which compartment holds the Red Quill flies, and he will then find out what they are like, and lesson number one is learnt. If, on the other hand, he catches a fly on the water, upon which the fish appear to be feeding, and compares it with the flies in his fly box, he will soon find a similar flying insect, whose name he will discover on the lid of his fly box, and

another useful lesson will be learnt, and so on, until such a list of the flies can be dispensed with.

Although I still possess them, I have discarded the use of large fly boxes for field work ; they are heavy to carry and there is a great danger that when handling it the box may be dropped, the flies lost, etc., and a greater difficulty will be experienced when trying to find the fly for immediate use.

Different Flies and When to Use Them

The hatches of the different varieties of flying insects during spring, summer and autumn merge into one another, and while the advent of some species is peculiar to spring, some to summer, and others again to autumn, several of them will kill all the year round.

The following names will form a very complete list of the most useful flies for fishing in different parts of Great Britain, and if a careful selection, taken from this list of artificial flies, be made and carried in two such boxes as I recommend, it should cover every variety of flying insect which are taken by the fish on any one water at any one period of the year.

Different varieties of flying insects to those given will be found to occur in certain districts, and some of the flies are local in their occurrence, but the list comprises the names of the imitations of the best known flying water insects, used by fishermen, with which trout are captured, and while the names of these flies may vary in different fishing districts yet the list will be found to be fairly comprehensive and reliable.

1 February Red.*
2 Red Palmer.* ||
3 March Brown.*
4 Greenwell's Glory.||
5 Iron Blue Dun.* †
6 Light Blue Dun.||
7 Light Olive Dun.* ||
8 Sand Fly.*
9 Blue Dun.* ||
10 Gravel Fly.* †

11 Blue Upright.* ‖
12 Light Evening Dun.†
13 Coch-y-Bondhu.† ‖
14 Whitchurch Dun. † ‡
15 Dark Olive.‖
16 Shaw's Fancy Hackle.‖
17 Grannom.*
18 Jenny Spinner.*
19 Cow Dung.* ‖
20 Hare's Ear.* ‖
21 Wickham's Fancy.‖
22 Tupp's Indispensable.† ‡
23 Governor.†
24 Red Spinner.* †
25 Red Quill.† ‖
26 Olive Quill.* ‖
27 Red Quill Gnat. † ‡
28 Yellow Dun.* †
29 Black Gnat.* ‖
30 Whirling Dun.‡
31 Alder.* †
32 Shaw's Fancy Winged.‖
33 Pale Dun.†
34 Welshman's Button.†
35 May Fly.†
36 Silver Horn.†
37 Blue Quill.† ‖
38 Coachman.† ‡
39 Stone Fly.* ‡ †
40 Ginger Quill.† ‡
41 Silver Sedge. †
42 Golden Sedge.† ‡
43 July Dun.†
44 Dark Coachman.‡
45 August Dun.‡
46 Red Tag.‖

* denotes the flies which appear as a rule in March, April or May.
† ,, ,, ,, in May, June or July.
‡ ,, ,, ,, in July, August and September.
‖ ,, ,, may be used with success throughout the season.
Thus * ‖ coming after the name of a fly denotes that it will generally appear in the early part of the year, March, April, or May, but that it is useful all the season.

The Gravel Fly, Grannom, Hare's Ear, Tupp's Indispensable, Stone Fly, Yellow Sally, and the Sand Fly, etc., are some of the flies peculiar only to certain localities.

Certain flies, such as the Blue Dun, Blue Quills, and Blue Dun Hackle, can at times be used in place of one another, and so with the Red Spinner, Red Quill, and Wickham's Fancy, also with the Light Evening Dun, the Light Yellow Dun, and the Light Olive Quill. By this I mean to imply, that if the fisherman does not happen to have a pattern of any one of the above flies exactly similar to the natural

fly on the water, he will be well advised to substitute any other of the flies thus grouped together.

Looking back over many years of trout fly fishing, it appears to me that though each district, or even the different rivers in each district, may have its own special order in the appearance of the metamorphosis of the aqueous life of its water insects into their flying state, yet the order in which I have placed the artificial flies will be found to have a fairly general application, and to be somewhat in the order in which these flying insects will appear, although some of them will be taken throughout the fishing season.

There are districts in which certain flies are successful at all times of the year, and for this reason it is advisable to avail oneself where possible of the experience of the local fishermen.

A certain fly may appear by the water side at an earlier or later date than usual, but it does not follow that at their first hatch such flies will be taken by the trout, or indeed until some weeks have elapsed after their first appearance.

Any of the above flies may be useful for dry fly fishing on lochs, etc. For wet fly fishing on lochs the flies locally used and tied on gut can nearly always be obtained.

If you intend fishing in any particular district, you should, when stocking your fly case, commence with the flies which are recognized killers on the rivers, streams and lochs which you are going to fish.

If, however, your fishing is likely to be extensive, and you are to visit different parts of the United Kingdom, then it will be well to stock all the flies in the list I have given, and arrange your small fly box daily.

Were I dependent on—say twenty—different flies, I should choose the following varieties :—

Three Shades of Olive Quills—light, medium and dark.‡
Two shades of Olive Dun—light and dark.‡
Two shades of Blue Dun—light and dark.†

Light Blue Quill.†
Red Quill.‡
Ginger Quill.‡
Yellow Dun.‡
Coch-y-Bondhu.‡
Alder.‡
Shaw's Fancy Winged.*
Wickham's Fancy.‡
Golden Sedge.*
Hare's Ear.†
Coachman.*
Iron Blue.†
Dark Winged medium Olive Quill.‡

It is important to remember that many of the Duns and Spinners, though similar in appearance, differ in the sizes in which they will be encountered, and while it is impossible to give anything like a perfect list of the sizes which should be within reach of the fisherman, I think that flies marked in the above list with an asterisk may be stocked on the No. 1 hook, but those marked with a dagger on a No. 00 hook, and those marked with a double dagger may be stocked in both these sizes.

The May Fly.

To those who can and do fish fairly constantly throughout the year the advent of the May Fly season is by no means an unmixed blessing. It certainly makes sport for the time easier, but it unsettles the regular feeding habits of the trout for several weeks after the May Fly has passed, and it induces rather a careless habit of relying on one class of flying insect as a lure, and a self-satisfied disregard of what may be frequently taking place, *viz.*, that other forms of Ephemeridæ, etc., are preferred, and are being taken by the trout. In this way the neglect of the ever varying character of the flies which are hatching out and being taken ensues, and frequently leads to a less successful day's fishing,

* No. 1 hook. † No. 00 hook. ‡ No. 1 and No. 00 hooks.

the tendency being to leave the ordinary fly box at home, and to persist in presenting the May Fly to fish who may be feeding on the Alder, the Welshman's Button, the Olive Quill, etc.

On the Patterns of Flies

The fly fisherman, to be generally successful, should endeavour to cultivate the habit of observation.

It will be the observant fisherman alone who is able at certain times, to discover the fly on which the trout are feeding, or at others he alone will be able, by recalling the result of former observation, to select a fly which will attract the fish, and thus find, by the success which will result from his selection, and by the non-success of his brother anglers, how extremely valuable is this knowledge.

Trout appear at times to throw off their accustomed caution and daintiness, and feed eagerly upon almost any variety of flying insect—no matter how it be presented to them.

At times, and this is the evening carnival, it has appeared to me that no matter how skilfully the fly may be cast, or what size or variety of fly may be used, the furious boil of rising trout will bring few, if any, fish to the creel (see The Rise, p. 80). Sometimes and under normal circumstances the exact size and shade of the natural fly must be copied in order to secure a fish, no matter how eagerly the trout may be feeding, and this again is the time when the observant man will score, especially when he is capable of making his own flies and carries with him the necessary material for the purpose.

An interesting suggestion has been brought before the readers of the *Fishing Gazette*. It was suggested by one of its readers that an International Collection of artificial flies should be founded, and a reply to this was

made by Mr. Val Conson, author of "Wet Fly Methods on Dry Fly Streams," in a letter to this paper (29.11.13) which, in my opinion, embodied the soundest advice. He said :—

> "Mature consideration, however, convinced me that the tendencies of such collections would not be beneficial to fly-fishing at large. Any system which tempts amateurs to copy copies, instead of to copy nature, is, in my opinion, bad for fly-dressing. I am all for individuality in fly-dressing. Let each man obtain a mastery over materials and their handling and then dress his flies according to the light of Nature, from Nature, rather than from books or other artificial flies."

I have pleasure in printing a letter from Mr. R. T. Wickham, which my readers may find of great interest. The conclusions so clearly stated by the writer of this letter were the result of practical observation by the late Mr. David Foster, and Mr. Wickham's letter will no doubt assist the fisherman in the selection of the most valuable flies to carry with him when fishing.

While not being able to acquiesce entirely in Mr. Wickham's theory that all the flies on our chalk streams are the descendants of four different families, I think that the proposition in itself should lead to a careful consideration of this theory, and doubtless to further knowledge. Mr. David Foster isolated in a floating tank the spinners of these four families, and he found that as a result be obtained the various kind of flies and water insects which are known on our trout rivers. The correctness of this theory therefore depends on whether or no the isolation was absolutely perfect.

> "December 19th, 1913.
>
> "Dear Mr. Shaw,—The theory of the Duns or Fisherman's Ephemera, which I was telling you about the other day, is much more fully set out in the

late David Foster's "Scientific Angler."* It must be something like twenty-five years since I first saw a copy of this little book, and about thirty-five since my cousin, the late Dr. Charles Wickham, of Winchester,† first told me of the theory—and I have so far found it a never failing guide to the proper selection of the likely fly, and also as increasing the interest of one's fishing. Briefly the theory is as follows :—

"That the Fishing Ephemeridæ are all contained in the limits of four distinct families, and that all the Duns we fish with are governed by the rules regulating these families. He holds that these families consists in order of size :—

"1. The May Fly or Green Drake.
"2. The March Brown.
"3. The Blue or Olive Dun.
"4. The little Iron Blue Dun.

"It was of the two last I was talking, as most concerning our ordinary trout stream in the South of England.

"Mr. Foster declared, and Dr. Wickham has told me he had proved, that all the larger Duns were the progeny of the Red Spinner, that is that the Blue, Olive, Yellow and Ginger Duns are each according to the time of the year, hatched out from the eggs of the Red Spinner, and that the colour varied progressively according to the time of the year and the temperature of the air and water. He found that from the eggs of the Red Spinner laid in June, he got :—

"In February, the Blue Dun.

"In April, the Blue Dun with Olive Legs or Cockwing Dun, varying on dirty days to the Dark, and on fine warm days to the Medium Olive.

* To be obtained from Messrs. Foster Bros., Ashbourne, Derbyshire, price 2s. 6d.

† The originator of that excellent fly, "Wickham's Fancy."

"In May, the fly became lighter—pale olive and Yellow Dun.

"In June, Yellow Dun, and Golden Dun or Ginger Quill.

"July to August, Ginger to pale watery, and as September came, so did the Olive tint return, and in October and November the fly again becomes the Blue Dun of the opening months of the year.

"But all these flies, no matter when hatched, become in a few days the Red Spinner or Red Quill Gnat.

"In the same way, the Iron Blue, often the darkest purple in the end of April, becomes paler through the seasons, at some times taking on an olive tinge—you remember Francis Francis getting Judson's Dyes to alter the colouring of the legs of his Iron Blues—and sometimes becoming almost as blue as a transparent azure butterfly, but changing into the Jenny Spinner, which is the parent of the race.*

"The March Brown follows in the same way from the dirty brown of April, through the turkey and light March Brown, to the grout Red Spinner or Mackerel.

"I have found this myself correct in every way—on the Itchen—in the Midlands—in Wales or in Scotland. There are the two sizes and in colours almost accurately altering according to the time of year, and so you will use your dark or light olive, your iron blue or ginger dun; remembering always that a dark and dirty or cold day will make the taking pattern a bit darker or earlier, and a bright dry time will brighten up the shades and colours to be used.

"The prevalence of the Red Spinner accounts for the value of the Red Quill, or Wickham's Fancy through the season—and I think the Jenny Spinner

* A very good imitation of this fly was known in my boyhood as "Hammond's Fancy," but its relationship to the Iron Blue was not recognized then.

accounts for the value of the Silver Bodied Dun on a wet dark day.

"The partridge and yellow, snipe and yellow, snipe and purple, and other such hackles are, of course largely the nymphs of the above flies, though there are others of the perlidæ and the phryganidæ, which are valuable on tree-covered or gravel bordered streams.

"The other thing we mentioned was my fancy for the Claret and Mallard, and its reasons. The pattern I mean is claret silk body, not fur or wool, ribbed round gold wire, black or furnace hackle, and grey mallard wings. I have this fly generally in nearly all sizes, and on unknown waters most often begin with it on the cast, in sizes according to what I expect at the time of year.

"On oo hook, it is a passable Iron Blue Dun.

"On o hook, it will do for a Blue Dun or a dirty Red Spinner and is the right size for any of the Olive Duns.

"On No 2 to 4, it is about the size and not unlike a March Brown in all its changes—a gravel bed or an alder.

"And lastly, as No. 5, or 6, it makes a dark moth or sedge, or in the May fly season, when this size kills best, a dark Mackerel. And it is not its worst fault that it is the best sea trout fly, and salmon do not seem to dislike it.

"I ask you to excuse this unconscionable epistle, and beg to remain,

"Yours sincerely,

"R. T. WICKHAM."

However exact may be the artificial fly, both in colour, shape, and size to the natural insect which the trout are taking, a fisherman will often find that his artificial one will be neglected in favour of the natural fly whose legs and wings may happen to be moving. In such a case, it is advisable

to change the fly for one of a totally different colour, shape and size, but I think it should be one which is generally on the water or taken at that particular season of the year. Nothing can be more illustrative of this than the usefulness of the Alder or the Welshman's Button during the May fly season.

The Rise

Trout rise to the fly at all hours and during all weathers. In the early moments of dawn, during the hottest hour of an autumn day, as the sun sinks, as darkness descends, and during the stilly hours of a midsummer night, distinct and noticeable rises of trout may be witnessed. If, however, I had to select any four hours on any day during the season in which to fish, I think I should choose the hours between 10 a.m. and 2 p.m.

The causes which lead to the rise—that mysterious impulse which suddenly quickens the trout world into the activity of feeding time—have, so far as I am aware, never been satisfactorily explained ; it is, therefore, with some diffidence that I advance a theory which I have held for some time as to this important problem.

I consider that one common cause of the rise is the sudden impulse of the pupæ of the Ephemeridæ to ascend to the surface and take wing.

Fishing one day with a Grannom on one of the stretches of the Axe, in Devonshire, I had by noon creeled several trout, when a furious rise of the fish commenced in my neighbourhood.

To my surprise, neither the rising trout nor the dace would look at the Grannom, and after many fruitless casts I decided to change my fly. This I did several times, but with no success, until at last I noticed a fly on the water.

By the aid of my small butterfly-net I captured the fly,

which turned out to be an Iron Blue in its sub-imago state, and the first I had seen that season. Hastily putting one on my cast, I secured a fish at my first throw, and although the rise only lasted some twenty minutes longer, I caught seven other fish. When the rise ceased there existed a big hatch of Iron Blue in the air, but the few solitary rising fish took no further notice of the Iron Blue Duns, which rapidly disappeared. I tried it, however, for some time longer, but eventually I replaced it with my Grannom, and creeled several other trout before going home.

Before putting on the Grannom, however, I examined the food in the latest caught fish, and found that the upper part of its gullet contained a great number of nymphæ or pupæ of the Iron Blue in their most advanced stage, several specimens having their wings already unfolded.

I am inclined, therefore, to think that, owing to some alterations of the meteorological conditions, the pupæ of this Ephemeridæ, moved by one of those mysterious impulses which occasionally influence the insect world, had risen to the surface to assume their sub-imago existence, and that this general movement was the cause of the trout leaving the Grannon in favour of the Iron Blue.

Since that occasion I have corroborated the theory I then formed by examining the food of the fish caught during a sudden rise, and have found that it consists, as a rule, of a greater number of the pupæ than the sub-imago of the existing hatch. I have also noticed the trout during a rise taking the pupæ below the surface, and have seen the trout following pupæ up, and taking them just as they reach the surface of the water.

I do not claim that this suggestion will account for all the general rises peculiar to trout, but I think that in many cases it can be proved to be due to some initial movement of the pupæ towards their next metamorphosis. A few heavy

drops of rain are followed or accompanied by a rise ; this rise may be produced by an upward movement of the pupæ in response to the meteorological influences at work. Again, certain summer evenings, at about the same hour and for a similar period, generally as the sun sets, will produce a general rise ; this rise, so well known to fishermen, is, so far as I can see, to be accounted for only by the cooler temperature inducing a general change from the pupal to the flying state of certain small water insects; these, as they ascend to the surface, become clearly visible to the fish, which follow them, and seize those which have not had time to assume a flying condition. The fish are not, therefore, feeding on flying insects. This evening carnival of the trout is invariably accompanied by an enormous hatch of small flying Ephemeridæ, etc., probably those which are missed by the trout and thus escape from the surface of the water to which they have risen. Again and again have I witnessed the water at such times fairly boiling with the rising fish, but it has been seldom that I have had the success of landing even as much as a brace of fish, though after this excitement has subsided, the Coachman, Silver Sedge, or Shaw's Fancy, have proved most deadly.

There is no doubt that " bulging " is produced by the activity of the sub-aqueous entomological life.

The method by which the latest food taken by a trout can be determined is by holding the trout in one hand, and, with a firm upward pressure of the fingers of the other hand along the lower sides of the abdomen of the fish towards the gills, expressing, or forcing into the mouth, the latest food swallowed by the trout, which may then be examined. Should this pressure not succeed to the satisfaction of the angler, the knife can be used to open the upper part of the gullet or stomach, in order to discover of what this food may happen to consist.

PLATE IX.

HAPPY DAYS ON THE OTTER, DEVONSHIRE

PLATE X.

EVENING FISHING.

"AND LEAVES THE WORLD TO DARKNESS AND TO ME."

The Best Time to Fish

The forenoon is, in my opinion, the most fascinating time for fishing ; there is no *arrière-pensée* as to coming darkness, the whole day is before one, the creel is light, and the anticipations and hopes of sport are keen.

As proving from my own experience the varying times of the day at which big trout may be caught with the dry fly, I give the following extract from some of my fishing diaries :—

1893.*—The Wye, Bakewell, noon, cloudy, 2 pounds 6 ounces, Olive Quill.

1903.—The Test, Nursling, noon, bright, 4 pounds, May-fly.

1905†.—The Otter, Devonshire, 9 p.m., calm, fine, 1 pound 10 ounces, Coachman.

1905.*—The Otter, Devonshire, 5 a.m., light breeze, fine, 1 pound 15 ounces, Red Quill.

1905.—The Irfon, Llangammarch Wells, noon, fresh breeze, bright, 1 pound 6 ounces, Shaw's Fancy.

1899.*—The Wutach, Black Forest, 11 a.m., baking hot, 2 pounds 2 ounces, Olive Quill. (Caught on the edge of a stream, in about four inches of water.)

1899.—The Arcque, Normandy, 4 p.m., gale, cloudy, 3 pounds 10 ounces, May-fly.

1897.*—Mountain stream, Norway, 2 p.m., baking hot, 4 pounds 11 ounces, May fly. (No May-fly known there ; quite calm, August, dibbling.)

1892. Lake near Felide, Norway, midnight, June, 4 pounds 2 ounces, Silver Sedge.

Plate IX. shows the two trout mentioned above, taken from the Otter.

The Evening Rise

Although some hours cannot be regarded as favourable ones in which to fish, yet trout will rise at floating food at all times during the night or day.

* These fish were caught by fishing the stream, no rise guiding me as to the fish.

† On Mr. George Peppin's water at Harpford.

After a bright and hot day during the summer months, the sub-imago stage of life will be assumed by many water insects, while innumerable imago forms of insect life will float or soar through the ambient air in the delicate mazes of their bridal dance. The trout at these times indulge in their usual evening carnival, presumably busy amid the ascending nymphæ, or perchance feeding eagerly on some smut-like flying insect. After this is over they settle down with serious supper intentions, and continue feeding at intervals, sometimes well on into the small hours of the morning. As darkness deepens, and before the full moon has risen to keep her vigil and illumine with her silvery enchantment the first sweet slumber of Nature, the fisherman, who has perhaps had a bad day, may be tempted to fish on, regardless of dinner consideration or of losing his last train. By facing west he can still detect the rise of feeding fish, and even if fish are rising close to the opposite bank and out of sight amid its shadows, the sound of the rise will very frequently guide him in making an accurate cast, and eventually landing a big fish. The rise of the fish at his fly will in most cases be seen, felt, or heard—seen, because a comparatively big ring will be caused by a rise, and on the slopes of the attendant ripple the glint and reflection from the western sky will be detected, even amid the blackness of the shadows under the opposite bank; heard, because the evening rise of a fish at a floating fly, owing to its more limited vision at night-time, is frequently more sudden and less dignified, and therefore, in most cases, more clearly audible amid the general hush of Nature; felt, because the fisherman's line at night should be as short and straight as possible, and when the fly is taken by the fish the tug will in most cases be distinctly noticeable. (See Plate X.)

Fly Fishing at Night

There are undoubtedly rivers or lakes on which during the day time it is almost impossible to obtain a fish, but on which it is possible to make very good baskets of trout during the night time, by casting well across the water with a large and darkish dry fly, and drawing this fly slowly over the top of the water, thus imitating the fluttering motions of a flying insect which has fallen on the surface.

A " dry " fly, which, from its size or its drag, will put a fish down in daylight, appears to stimulate the same fish at night time. One can, therefore, fish with a dry fly at night, can throw to the sound of a rise, and, by gently dragging the fly along the water, can feel the touch of the rise which is likely to follow. A large fluffy fly, such as the Stone Fly, or a Sedge, will be found to be the best to use.

The best method, in playing a fish at night time, is to move the rod point in the opposite direction to that towards which the fish is struggling, and to continue to do this until the latter is sufficiently quiet to be drawn in and netted.

Fishing by Moonlight

And now the moon has risen and is lighting a path of silvery brightness on the placid waters of the trout stream. You are wading, and the stream is broad, and the banks low. Watch this path of melted silver, spilt as it were on the inky surface of the stream, and ere long a small speck will appear, followed by a single tiny ring which quietly opens out round it—a rise which would not, perhaps, have been noticed in the daylight, though probably caused by a good fish. Now throw your Silver Sedge just above, and let it float over the place in which you saw the rise, and you will get your fish, maybe with less trouble than you would

experience in daylight. The pall of night is your background, and therefore the fish are less able to see you; they are not so suspicious, nor so prone to seek the shelter of the weeds or the entanglements of their retreat, and until they see you they will not know from which quarter comes the galling restraint of your fly.

CHAPTER V

THE SENSES OF TROUT AND HOW THEY AFFECT THE FISHERMAN

The vision of a trout—Horizontal sight—Vertical sight—These factors as they affect the fisherman.

I think it may be accepted as a fact that fish can distinguish the flavour of different kinds of food, but, so far as I am aware, it has not been decided whether it is their olfactory organs which are affected, or whether they possess a sense of taste only. The use of paraffin may cause a more rapid rejection of the artificial fly by the trout, but whether it might not be advisable to apply an odour to the body or hackle of a fly—similar to that of the real fly—remains to be proved. Fishermen have claimed that certain flavours are beloved of trout, but the result of personal experiment in the application of such flavours to the body of a fly is a branch of fly fishing still very much open to original discovery. I have experimented with various essences, and considered that I met with success by mixing two or three drops of the oil of aniseed with my paraffin-oil. This suggestion may be of some use to my readers, and perhaps induce them to continue such experiments until some perfect mixture has been discovered.

Trout are undoubtedly sensible to colour distinctions, and they can also detect the most subtle differences in the shade and tint of the different parts of the various water insects on which they feed, whether the difference exists in the wings, the hackle, or the body of the fly. It is fortunate, therefore, for the fisherman that there are not only

variations as regards colour in the individual members of each hatch of water insects, but also that trout do not always appear to exercise the power of discriminating which they undoubtedly possess, but will rise freely to the poorest imitations of the flies which are on the water.

I do not consider that trout can appreciate sound as we know it ; rather are they gifted with a fine sense of all vibratory motion. Sound is communicated by the vibration of the air or other elements, but other vibrations of these elements can be produced without sound, and the trout may, therefore, depend on the tactile nerves rather than on the auditory ones. If trout were dependent on the faculty of hearing for their safety, and relied to any extent on this faculty to give them warning of a danger which might not be within their range of vision, I do not think that wading would be so productive of good results as it undoubtedly is. The noise of one's brogues on the pebbles can be distinguished when the ear is submerged for considerably over half a mile in perfectly quiet and unbroken water in rivers, and for miles in lakes.

The Vision of a Trout

Although it is supposed that trout cannot see an object which is behind them—that is, in the direction of their tails, I am of the opinion that under certain conditions they can indirectly perceive the approach of any object above the surface of the water, even when such objects are directly behind them, *i.e.*, in what I call the normal zone of invisibility. (See Diagram 1, C.E.D.).

I have noticed that however carefully I have approached from the lower end of a shallow, pebbly pool, unless my approach is masked by a heavy background of trees, the trout in the shallow and lower end take fright and run up into the upper or deeper portion. For many years the

uncanny quickness of trout in discovering my vicinity under these conditions completely baffled me, but curiously enough the explanation came to me when bathing in the Ifafa River, Swaziland. I had been swimming in just such a pool as I have described, and had drifted to the lower and shallow end. My body was resting on the pebbles, and my eyes were just above the water gazing up-stream, when my attention was drawn to a distinct lessening of the light on the pebbles in front of my eyes, and slowly turning my head, I found two Reit buck standing on the bank of the river a little distance below me, and silhouetted against the clear sky, from which position they had appreciably lessened the light falling on the pebbles. Their curiosity had evidently been aroused, and they appeared to be looking at me intently. I did not move, but something frightened them, and they turned and bolted out of sight. The incident, however, solved the difficulty.

In shallow, pebbly pools the trout lie immediately over the glistening and reflecting surface of the pebbles. Any object, therefore, which comes between these pebbles and the sky must shut out some of the light which falls on them, and this lessening of the light they reflect must warn the trout that some object is moving or approaching them from down stream, and hence their movement up stream.

Horizontal Sight

If the eyes are assumed to be the centre of the horizontal plane in which the fish is lying, a trout, in ordinary condition, can see in that plane from a point right ahead to an angle of about sixty degrees behind each shoulder. In other words, any object situated in the 300 degrees of the forward part of the horizontal circle surrounding a trout, will, as a rule, be visible, while any object situated in the remaining sixty degrees of that circle would be

invisible. Mr. Sheringham told me some time ago of a case in which he had proved that trout can apparently see at times directly behind themselves. I admit that trout do become aware of a danger at times, when in the supposed zone of invisibility, but not in the horizontal plane in which the trout is lying. It will generally be found that if an object be thus seen by the trout it will have been because the object has been lifted at some height above the surface, where the bulge of its shoulders would not intervene between its eye and the object, as it would if the object and the trout's eye were in one plane.

In Diagram 1, if A B C D represents the horizontal plane in which the trout is lying, E the eye, and T the tail of the fish, its eyes are naturally directed up-stream, and when in this position it can see any object in its own plane in the unshaded portion D A B C, and cannot directly see, without moving its position, any object in the shaded portion C E D. Hence it is that the fly fisherman, when within this latter zone, can generally approach his fish without being detected.

Vertical Sight

In any vertical plane passing through the eye of the trout, however, a different range of sight has to be considered, and an entirely new factor presents itself—this is the refractive influence of the water on all rays entering it. I need not here enter into the laws of refraction, but will ask my readers to accept as a fact that the vertical range of the vision of a trout, as regards all objects external to the water, may be regarded as being confined to the interior of a hollow cone, the apex of which cone is situated at the eye of the trout, and the sides of which rise upward, meeting the surface of the water at an angle of 42 degrees. So far as the fish is concerned, within this hollow cone—which,

therefore, subtends an angle of 96 degrees in every upward direction—is confined the view of all objects within the 180 degrees vertically above the water. In other words, the trout sees, as it were, *all* objects above the surface of the water within an arc of about half that in which these objects really exist, and consequently, the comparative size of these objects must be relatively smaller in view of their being cramped into its smaller field of vision.

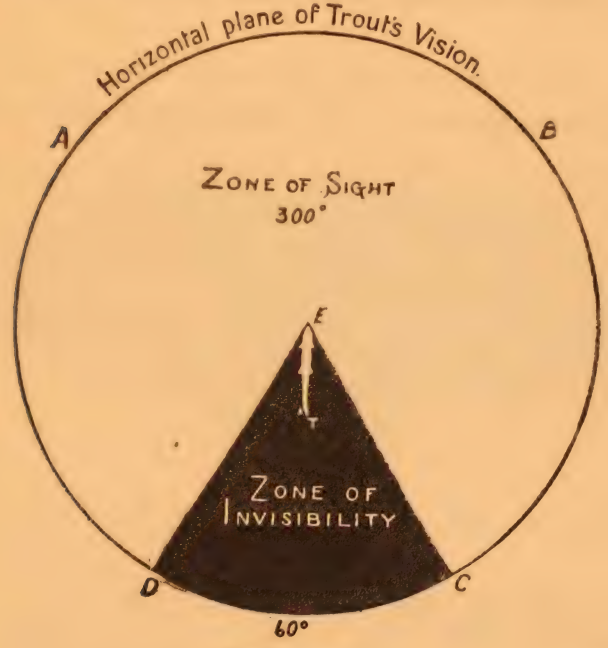

Diagram 1.
A B C D, horizontal plane of trout's vision;
E T, trout;
D A C B, horizontal zone of trout's sight.

In order to make this perfectly clear to my readers, I have shown two diagrams.

In Diagram 2, E is the eye of the fish, from which rises a vertical cone E A, E C, E B, E D, the sides of which cut the surface of the water as shown at A B C D.

All rays of light from objects above the water *which reach the trout at E* must enter the water within the circle

A C B D. Let A E B (see Diagram 3) be a vertical section of the cone in Diagram 2, cutting the surface of the water at A B. Then the rays of light from M N can only be seen by a trout situated at E, when they enter along the dotted lines, N B E, M *b* E, and the fish sees M N as in the direction *b* B, and also relatively reduced in size to *b* B.

Objects immediately over the trout will suffer least from the influence of refraction, but their appearance will suffer the more as they leave the zenith and approach the horizon.

To the trout the full moon as it rises will appear as a small horizontal line of light forty-two degrees *above* the

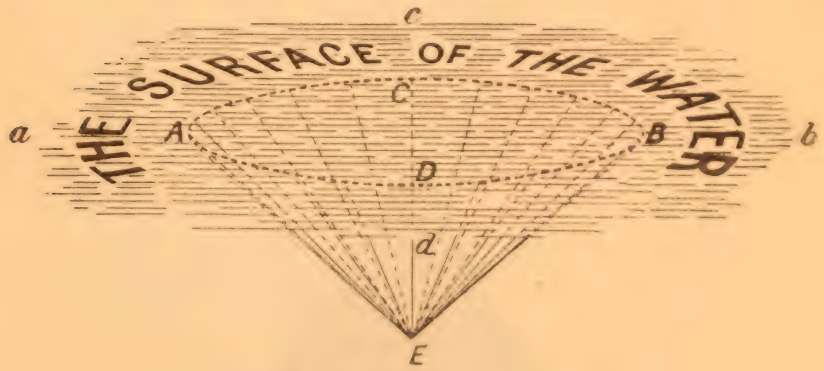

DIAGRAM 2.

a c b d, A B C D, surface of water;
E, the eye of trout;
E A, E B, E C, E D, the upward cone within which is confined the trout's sight of all objects above the surface of the water within the range of the trout's vision.

real horizon, and it will gradually assume its circular shape as it approaches the zenith.

It will thus be seen that the nearer an object is to the water level when outside the water, the less will be the angle which it will relatively subtend to the fish; in other words, the lower the position of an object when at equal distances, the smaller it will appear to the fish.

These Factors as they affect the Fisherman

This important fact is taken advantage of by the fisherman, who, although he may not understand the optical laws of refraction, has learnt from experience that, in order to avoid scaring the fish, he must crouch as much as possible and thus reduce his height, and that an overhead cast is more likely to scare a fish than a side cast. Not that he escapes being seen when within the limit of the trout's vision, but his bulk and that of his rod are then generally

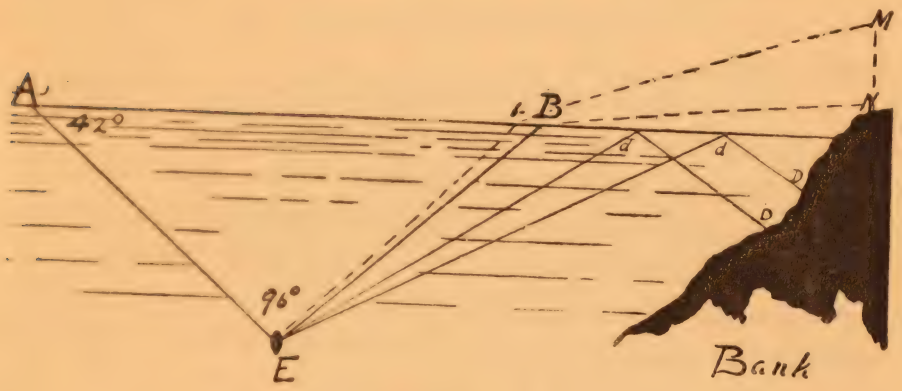

Diagram 3.

A E B, a vertical section of the hollow cone in Diagram 2, cutting surface of water at A B.
M N, any object on land, such as a man.
E *b* M, E B N, the lines along which the rays of light from the man M N will travel to the fish.
E *b*, E B, the direction in which the trout will see the man.
E *d* D, E *d* D, the lines showing how the under surface of water acts as a mirror to the trout of all objects under the water and outside the cone E A E B.

insufficient to frighten the fish seriously. Wading is for this reason the best method of approaching fish. Although a man's size is relatively reduced the more nearly he sinks to the level of the water, still, in ordinary circumstances, he is clearly visible on the trout's horizon when within that part of the zone D A B C, Diagram 1. If, then, this

appearance is accompanied by an invariable agitation of the surface, or the violent appearance of lines or flies over a trout's head, even the most unsophisticated fish will quickly learn to associate these two phenomena, and be increasingly ready to take fright when a man is seen. Hence the necessity for caution when approaching a fish, and delicacy and finesse when casting on the part of the fisherman—not only on his own account, but out of consideration for his brother anglers. The lifting of the line from the water when making the backward cast should be effected in the smoothest and the most delicate manner possible for the latter reason.

All other downward rays coming to the eye of the trout, save those which enter the arc subtended by the cone of the trout's vertical vision, are external to the cone, and are either from the submerged portion of some floating object, or the reflections from the under surface of the water of sub-aqueous objects, the water, in this latter case, acting outside this zone as a huge mirror of all bodies below its surface (see E *d* D, E *d* D, Diagram 3).

It must not be supposed that this mirror is an unbroken one, for every object falling on and breaking the surface of the water becomes at once visible, not only within the zone A. C. B. D., Diagram 2, but outside this zone. This is an important point, and is one which is but too often over-iooked by the fisherman. I have frequently met people who imagine that, because they throw their line so that it does not fall within the circle A. C. B. D., they are by so doing preventing the trout from seeing it. When coaching Major Sir William Evans Gordon, in 1909, I was explaining the method of avoiding the drag by throwing the line so that it fell in an up-stream curve on the water, and he suggested the advantage that this cast would have in presenting the fly to a trout immediately up-stream. He

was correspondingly disappointed when I explained to him that this would have little or no effect so far as the vision of the trout was concerned, for whatever advantage there might be in preventing the line from falling directly over the trout, it would be equally, if not more distinctly, visible to the fish as it broke the surface to either side.

It may be taken for granted that, in ordinary circumstances, when a fisherman can see the trout the trout can see him. There are, however, three influencing factors, which must always be considered :

1. The amount of light falling on either.
2. The glint or glare in the eyes of one or the other.
3. The background of each.

1. The first may be considered as sometimes favouring the fish and sometimes the angler.

2. The second factor will be mostly in favour of the fish ; the fisherman gets most if not all of the glint and reflection from the surface, though the glare of the sun must handicap the fish to a great extent.

3. The third factor is the background, which, however, is almost invariably in favour of the trout. A dark background is of the greatest importance to the fisherman when approaching a fish, and a skyline behind is always to be avoided. If, when fishing from the bank, he has no near background, such as a wood, a hedge, a wall or tree, etc., he should be as little above the water level and as much behind the fish as is possible. Wading, again, for this reason, will be the most advantageous position for the fly fisherman.

It may be argued that the appearance of the waders below the surface, when within the zone of the lateral vision of the trout (see the unshaded portion of Diagram 1), will scare the fish more than the appearance of the fisher-

man above the water. This is not so, however, for the rays of light from the fisherman on the bank, say at forty feet distance, would lose nothing in passing through the air till they strike and enter the water (as at *b* B, Diagram 3); they will then only have some two to four feet of water to pass through before reaching the fish. A certain amount of light will be undoubtedly lost, even in this small distance, owing to the density of the water, but the vertical depth of the fish below the surface of any trout stream will never be sufficiently great to prevent all rays reaching it. This density of the water will cause a very rapid diminution of the rays from any sub-aqueous object, as horizontal or vertical distance is attained; and while objects may, in favourable circumstances, be still visible to the fish twenty-five feet away, in any horizontal direction within the zone of its horizontal sight, they may in calm, still waters be taken as being unnoticeable in ordinary circumstances at a distance of about thirty feet. In rapid running water the rays from any object will be still further lost or deflected by the eddies, etc.

From my own experience in a diving-dress in the clear waters of the Torres Straits, which were undisturbed by any ripples, eddies, etc., I found that all objects in the horizontal plane were invisible to me beyond a distance of about twenty feet: the head of a shark coming towards me would be visible at about seventeen feet, while its tail would at the same time be quite invisible and lost in the misty wall surrounding me.* It may be, therefore, confidently assumed that the wader, even when faced by the trout, will, as far as his waders are concerned, be unnoticed by the trout at a distance of from twenty-five to thirty-five feet.

* While this limit to my range of sight may have been due, to a certain extent, to the thick glass of the helmet through which I had to look, the greater part of it would be due to the absorption of light by the water itself.

CHAPTER VI

PISCICULTURE AND A FEW REMARKS ON THE NATURAL HISTORY OF THE TROUT.

Cultivation of trout—Consideration when breeding—The description of a Trout Fishery—The Itchen as a Trout Stream—Relative values of food stuffs for trout—Trout and the close season—Time of spawning—Close season too short—Board of Conservators.

THE scientific development of the most delightful of all sports—namely, fly fishing for trout—has produced a corresponding advancement in the breeding of these beautiful and sporting fish, and no book on trout fishing would be complete without a reference to fish culture. Pisciculture as an occupation, if wisely and scientifically pursued, will not only create a fascinating and absorbing interest for the one who takes it up, but it should, under favourable circumstances, become a remunerative and sound commercial business. Although dating back to the early Egyptian dynasties, fish culture received its first great impetus in the middle of the eighteenth century, when the possibility of artificially fecundating the ova of fish was discovered by one Stephen Ludwig Jacobi, of Hohenhausen, in Westphalia. It was not, however, until 1837 that fish culture was inaugurated in Britain by a Mr. John Shaw, who fecundated the ova of salmon and reared the young fish.

Trout farms have become numerous in England, and I wish to impress on the student the advisability of not only reading and studying the literature of trout breeding, but also, by personal visits to any trout-rearing establishment

in his vicinity, gaining a practical knowledge of the fish which he will in the future have to encounter.

Consideration when Breeding

It is of the utmost importance to secure strong and healthily reared yearlings and two-year-old fish for all streams, lakes, and ponds which are being restocked, and the more nearly the conditions in which the fry, the yearlings, and the two-year-old fish are reared, approach those of nature, the better will the results be. Mr. Livingstone Stone, a Fish Commissioner of the United States of America,* guided by his own experience and that of every trout-breeding establishment with which he had, either as manager or commissioner, been brought into contact, is strongly opposed to risking breeding ponds in the channel of any stream or river, and advises the artificial construction of ponds, fed by artificial races. These ponds, he thinks, should be small and compact, lined with wood, and freed from any danger of floods, etc.; and he recommends the use of water plants as affording shelter and food for the trout.

These ideas, sound as they undoubtedly are when the dangers above enumerated are considered, have been followed more or less by English pisciculturists, and the logical consequence of these artificial surroundings has been a loss of the many natural advantages of the other method—that is, of having trout pounds situated in bye-channels of recognised trout streams.

The want of the natural food carried by a good trout stream, and the want of the plentiful supply of fresh running river water, the reliance on artificial food, the vicinity of the keepers, the feeble current, etc., all tell

* Author of "Domesticated Trout," a book full of information and interest to all fishermen, published by The Fishing Gazette, Ltd., 19, Adam St., Adelphi, W.C.

against the trout reared under such conditions. For one thing, I am confident that trout reared under these conditions and accustomed to be hand fed, do not, when they are taken to stock other waters, rise to the fly as freely as they would had they been accustomed to depend more on natural food during their early life.

For another thing, the trout do not grow so quickly, and again, they are not accustomed to the natural food on which they will have to live when they are liberated. The best food for trout, as long as a plentiful supply is available, is undoubtedly water insect life in its varying stages. Small fish, such as minnows, gudgeon, etc., are the next best food—although trout, when fed on this latter class of food, frequently develop cannibalistic tendencies—while probably the food least beneficial, in an all-round sense, is the animal food on which hand-fed trout have frequently to depend.

The effort which is demanded from the alevin in order to resist the natural movement of the running water creates a more developed and more powerful fish.

Taking the stock fish of the ordinary trout-breeding establishment, the length of time which it takes them to recover from their breeding operations is the greater owing to this artificial and restricted flow of water. Fungus is not so easily shaken off, neither are the wounds and abrasions of the breeding-time so quickly healed. It may be accepted as a fact that trout should have plenty of water, plenty of space, and plenty of food, and the more natural the conditions of these three factors the better the results in trout breeding.

To those, therefore, who may be inclined to devote their attention to trout breeding, I would strongly recommend the adoption of breeding pounds situated, *when possible* and *where safe*, directly in the by-paths

of some portion of the best trout stream available. As an instance in point, I can refer to the Itchen Trout Breeding Establishment, in Hampshire, the breeding pounds of which are directly in the flow of the Itchen River at Lower Chilland, Itchen Abbas.

With the exception of the hatcheries themselves, in which spring water is used, all the troughs, boxes, pounds, etc., are directly treated to a plentiful supply of river water; the fry—*i.e.*, the young trout—immediately after passing out of the alevin or yoke-sac period are brought up directly in the life-bearing and cool waters of the Itchen, and the consequence is that, both as yearlings, as two-year-old fish and onwards, the size and healthiness of all the trout are phenomenal.

The Description of a Trout Fishery

In order to illustrate the natural conditions of these remarkable breeding pounds, I have shown my readers in Plate XI., a portion of these pounds as they occur in the bed of the stream looking up stream.

This Plate shows the upper pound in which the stock fish (from three to five pounds) are kept. The river is here screened off and so controlled by hatches that the *entire* flow of the River Itchen (here a considerable stream) can be poured through the stock pounds. The surplus current of the river runs over a weir to the right, and while the screens placed across so rapid a river as the Itchen require careful, and during weed cutting operations constant attention, the advantages to the fish of having the natural flow of the river water is great. The keepers are shown as standing on the lower screens of the upper pounds, and immediately above the upper end of the pound for two years old fish, which extends for 200 yards down stream.

Below this is the home stretch devoted to eight-inch

THE ITCHEN TROUT BREEDING ESTABLISHMENT, HANTS.

THE UPPER POUND FOR THE STOCK FISH AND THE HEAD OF THE POUND FOR TWO-YEAR-OLD FISH. LOOKING UP THE RIVER.

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fish. At the lower end, near the hatcheries, the river is divided into three other pounds, into which the stock fish are drafted during the breeding season, and others in which certain drafts of fish are kept prior to being dispatched to their final destination in some other water.

On the lower side of the home pound and between it and the main river, are situated innumerable small canals, carefully screened, into which the river water is directed, and in these the varying classes of fry of the brown and rainbow trout are reared. It is, of course, in these lower breeding ditches that there is the problematical danger of flooding, but floods are practically unknown in this portion of the Itchen, owing to the rapid flow of its waters and the vicinity of its source.

The Itchen as a Trout Stream.

The happy reminiscences associated with this delightful pastime, as well as the sporting character of this portion of the Itchen, will be realized by the following letter written to me by the former owner of this fishing.

"*February 26th*, 1912.

"Dear Shaw,

"Your handwriting reminds me of what, alas! are now 'old times'—of times that for me can never return now, for my rod is laid aside for good, and all the fishing I now do is in dreams.

"I recall the first day on which you fished my water—it seems to me but yesterday—though more years have passed than I like to think of since that hot summer day, when I met you at the station and hastened, as we walked across the fields, to assure you that sport could be but small on so bright a day, and with such low and bright water as we then had. How well I remember your confident rejoinder that you would catch some fish notwithstanding

the drawbacks of the day, and your going on to ask what should be done with the fish you caught—did I want them, or should they be returned to the water? etc., and my response that, personally, I had always found it safer to catch the fish before disposing of them. Then when at the river side, do you remember how you began catching fish almost immediately, and kept on doing so during the remainder of the afternoon? and, if I remember rightly, your total mounted up to some forty-five (or forty-seven, was it?)*

"How clearly I recall the lovely clear running stream, and your figure on the water. I had many anglers then, but do not remember anyone who came near to that record day of yours, and it ever comes first to my memory when I think of my fishing days. Certainly, though living on the water, I never came near such figures myself, and should not think many better records existed on the Itchen.

"Sincerely yours,

"G. R. BRYANT."

Perhaps I may be forgiven for putting in so eulogistic a reference to myself, but I am certain that to the majority of my readers it may recall the delights of similar happy days, and in any case it tends to show how the pleasant memories of such times linger in the minds of fishermen even when they are at last compelled to lay down their rod and creel.

A river, then, which can support such a wonderful number of wild fish is eminently suited for trout rearing, and the trout which are reared at Lower Chilland breeding pounds fully establish the advantages which I claim for such a method. There are probably not many rivers in

* My friend is correct as to the number of the fish; all but nine of these fish were returned to the river or placed in the stock pounds. The keeper's estimate of the weight of the fish was that they averaged 1½ lbs.

England so favourably situated in every way to produce such happy results, but where such exist this system is well worthy of trial.

The Relative Value of Food Stuffs for Trout

The relative value to trout of the best varieties of the different food stuffs may be roughly estimated as follows.

If fed on :—

	Increase in weight.
Water insects in their larval or flying condition	100%
Meat	50%
Fish	38%
Cereal or bread stuff	12%

There also appears to be a distinction, attendant on their food, in the habits of the young trout, the insect eaters being, as a rule, more active and better shaped. It seems, however, that the large size to which New Zealand trout attain is largely due to the presence of a *very great* quantity of small silver-hued fish, locally called Whitebait.

Some idea of the size of the fish in the Lower Chilland Hatcheries may be gathered from the fact that the two-year-old fish, ready for delivery in January, average nine inches, but that a certain number of two-year-old fish attain twelve inches in length in April of the same year. The fish in the Lower Chilland Hatcheries are largely bred from ova taken from the wild fish of the Itchen.

Variations in the temperature of the air and water exercise a most important influence on aquatic life.

The relative increase in the temperature of water assists and quickens the incubation of all sub-aqueous eggs, and hastens the metamorphosis of all insect life.

Under favourable circumstances the rapid growth of a trout is extraordinary. Trout from the upper waters of the Dart, where natural food is scarce, and the fish in consequence are small, quickly grow to a very large size when

placed in the more productive waters of ponds and reservoirs. Trout will feed better in fairly temperate weather than when it is very cold, and a rise in temperature after a cold spell is productive of good sport, due to the improved appetite of the fish, to the greater activity of insect life, and sometimes to their quick recovery after spawning. Trout lose their desire for food as the spawning time approaches, and though they commence feeding after it is over, they do not regain their full feeding powers until the warm spring weather is reached.

Trout and the Close Season

I am inclined to think that to the majority of trout fishermen the natural history of the Salmonidæ is as a sealed book. Fishing to them is but a pastime to which the most delightful hours of their outdoor life are devoted, and save during the moments which are spent in the actual pursuit of this sport their interest in these game fish seems to disappear.

The life of the trout during the close season, for instance, is practically unknown to the average fisherman, and while the necessity of observing such a period is recognized, the wisdom of the limits imposed by the various fishing associations is but seldom considered, and receives but a small proportion of the criticism which is deserved by so momentous a subject.

Are trout sufficiently protected by the present limits of the close season ?

In order to strengthen my own impressions in this matter and to avoid the possibility of mistake, I wrote in 1906 to the managers of several breeding establishments, to gentlemen interested in trout breeding, and to those in charge of various trout fisheries, asking them to give me their experience as to the period which covers the loss of appetite prior to

spawning, the dates on which the trout in their immediate neighbourhood commence and cease to spawn, and the length of the period taken by trout to recover from their spawning operations.

Times of Spawning

From the information which was then placed at my disposal, and which has since been confirmed by my own experience, it may be taken as certain that the general limit of the period during which wild and domesticated trout spawn is from October 15th to the end of January, although trout are known to spawn as late as the middle of February. The average period during which most trout spawn, however, may be accepted as occurring between October 25th and January 12th, the temperature of the weather and the amount of water in the rivers considerably affecting even this early or late spawning season. Trout in their natural condition suffer a loss of appetite commencing from eight to three weeks prior to spawning, this loss of appetite depending to a considerable extent on their condition towards the end of the fishing season. If the trout have experienced a warm summer, with plenty of food in the shape of insect life, their condition early in the autumn will be good, and a more extended period of fasting may be expected prior to spawning. In some cases they begin to feed immediately after spawning, and, if the circumstances are favourable, will be clean and in good condition from three to four weeks afterwards. If, however, the conditions are unfavourable, they may not commence to feed for several days after spawning has ceased, and their complete recovery will be relatively delayed if the weather be unfavourable.

The importance of a careful consideration of the above facts when deciding the limits of the close time will be better appreciated when it is thoroughly understood that,

from the time the fish begin to lose their appetite prior to spawning until they have entirely recovered their condition after spawning, they are unclean and not fit for human food.

Those fish that do happen to feed as their spawning operations approach—and this may happen during the open season—appear to suffer at times from a disease of the intestines, and are afflicted with worms. Strict laws should therefore be made and enforced in order to prevent the possibility of trout being captured and destroyed when near spawning time, or when their condition renders them unfit for human food.

Close Season too Short

It is the opinion of many fishermen that trout fishing opens in some districts at too early and closes at too late a date. The fisherman whose experience has extended over many districts, and who has fished early and late in the season, will recall the frequent capture of ill-conditioned or dirty fish at the beginning and towards the close of the different seasons. These are fish which have begun to feel the influence of, or which have not recovered from, the spawning season. Such fish should, of course, in all cases be returned to the water, but it would be wiser that the chances of killing or injuring these fish should in no case be incurred.

Meteorological conditions affect the time of spawning, and also affect the length of the period which it takes a trout to recover after the spawning operations are over. This is especially so in the wild fish. Even in the same districts spawning conditions vary very considerably ; not only the temperature of the atmosphere, but the temperature of the water in two neighbouring streams, will produce a relatively early or later spawning season, as the case may

be. The locality of the rise of each river should be considered, as well as the rise of each of its tributaries. The snowfall and the meteorological circumstances of each season should be carefully considered twice a year, and any hard-and-fast period selected for the opening and closing of the trout-fishing season should therefore be modified by the peculiar circumstances of each river and each season. Trout fishing can be legally pursued between February 1st and October 2nd, except in those districts in which the conservators have wisely extended the length of the close season. It is unnatural, foolish, and unsportsmanlike, to permit fishing during periods in which ill-conditioned fish can be caught ; but at the present time many rivers are deprived every season of a considerable quantity of ova, and suffer the loss of many ill-conditioned fish owing to an insufficiently extended close time. For these reasons alone it is advisable that the close season in many districts should be still further extended. Many of the March fish caught in the Welsh rivers during a hard spring, for instance, are as unfit for human food as is the salmon-kelt. The fish on the first warm day are ravenous, and at such times they will take any bait, no matter how unskilfully it may be offered to them. As a natural consequence, the rivers lose many of their best fish before the latter are in a condition either to discriminate as to the choice of their food, or to have a sporting chance of successfully fighting for their lives, to say nothing of their being in such cases quite unfit for food.

The Board of Conservators

The opening of the trout-fishing season is regulated by the fishery conservators, and if the gentlemen controlling these associations could only be induced, in the interests of the rivers they control, to consider the causes which lead to the depopulated condition of certain rivers in June and

July, it is probable they would defer the opening day from the middle of February to the middle of March, or even later. I have noticed that local fishermen on many Welsh streams seem to regard their legitimate fishing as over by the end of May, and judging by the big creels which they are able to obtain in February, March, and April it is little wonder that they leave the rivers and the few remaining trout during the summer months to the anxious attention of their visitors, whose dry fly but too frequently falls on waters from which nearly every trout of takable size has disappeared. It must be evident that with late spawning fish and a very hard January, February, and March, it is a mistake to permit trout fishing to open in February, or indeed until the great majority of fish in each particular river have recovered their condition. Rivers in which the trout spawn late are said to produce the best results, as the alevin emerges into the world under more favourable conditions so far as temperature and weather are concerned ; but in each district, whether it be relatively early or relatively late in its spawning, contradictory as it may seem, the early spawners produce the best results.

CHAPTER VII

WET FLY FISHING, SPINNING, KNOTS, WEEDS, AND GENERAL INFORMATION

Wet fly fishing up-stream—Striking—Arrangement of flies on cast—Spinning during the summer months—The single-handed spinning rod and reel—Casting from the reel—Ambidexterity—Knots—Sex of trout—Weeds—Fungus—Selection of flies when by the waterside—The cap as a fly holder—Dry fly fishing with three flies—Moths—The broken rod—Whipping a broken rod—Bulging trout—Keeping the line clear—Changing the fly after dark.

Wet Fly Fishing Up-Stream

Wading is almost imperative in open water when wet fly fishing up stream, and though this style of fishing may during the earlier and colder months of the year, be more productive than dry fly fishing, it is not every one who cares to invite rheumatism or endure the cold inseparable from wading during March and April.

When fishing up-stream with the wet fly, the line, after the flies have touched the water, should be kept straight. The tail flies should not as a rule sink more than a few inches below the surface, the first dropper only an inch or so, and the upper dropper should skim the water. The cast being made, the fisherman should take in the slack as the flies come back with the stream, and a slight jigging motion *may* be imparted to them. The rise of the fish is almost invariably seen, and success depends, therefore, on four things—the choice of flies, the fisherman's ability to throw a line, his quickness in striking, and his knowledge of a fishing stream. This method of wet fly fishing is not only

highly successful, but far more interesting than fishing down-stream. Wading is almost a *sine qua non*, as the bank is too conspicuous a place for the angler; and this is the drawback of wet fly fishing up-stream, for the line must as a rule be fished short, and a fisherman, having to use a short line, must of necessity be closer to his fish than in dry fly fishing. The greater the stream lore of the fisherman, other things being equal, the greater will be his success. Rising fish will naturally induce special attention.

Wet fly fishing up-stream possesses many of the charms of dry fly fishing, and as a sport it comes next to it in scientific interest and pleasure. The object of jigging the wet fly when in the water is to imitate the action of the nymph or pupæ when swimming; the object of letting it float steadily down with the current being to imitate the drowned sub-imago. Hence, when drowned sub-imago are not present, and the pupæ are being taken by the trout (any captured trout will readily solve this point), a series of little movements should be given to the drifting flies by tiny jerks of the point of your rod. After a thunderstorm, when numbers of drowned sub-imago are coming down, the pupæ are not as a rule moving, and it is better to allow the fly to drift down with the current.

Striking

In wet fly fishing up-stream the fly at which the fish rises is near the surface. The motion of the fish, or perhaps the fish itself, can be seen, and the strike may therefore be made either at the time the rise is seen or the touch is felt. When, however, the fly is well below the surface, as in wet fly fishing down-stream, the first intimation the fisherman gets that a trout has taken one of his flies is the pluck or pull at his fly. In most cases this pluck in itself is quite sufficient to hook the fish, and therefore, in so many as eight cases out of

ten, the hooking of a fish with a wet fly down-stream cannot be claimed as being due to any skill or quickness in striking ; while in at least eight cases out of ten the fish hooked with a dry fly or wet fly up-stream may be fairly claimed by the angler as due to his skill in striking. An immediate strike when the fly is taken by the fish below the surface of the water is seldom advisable ; and equally it is true that an immediate strike is in nearly every case advisable if the fly be taken when floating on the surface.

Arrangement of Flies on Cast

When two, three or more flies are being used on a cast, the question as to the best distance which should separate them is an important one.

With a short cast it is generally advisable to use only two flies.

In wet fly fishing down-stream a long gut cast should be employed, as more space can be allowed between each fly than when using a short cast.

If the flies which are being used are of a large pattern, plenty of room should be allowed between each one, but this space can be reduced as the cast becomes finer and the flies smaller. In discoloured water, again, a shorter distance between each fly may be arranged even when using a fairly large pattern of fly. In selecting the tail fly, the one most likely to attract the fish should be used, and the droppers, as the other flies are called, should be attached to the cast by a length of gut not more than three inches from the cast to the fly. Single-winged flies should be used, with a fairly stiff hackle. I think one gold-ribbed fly should always be used on a cast. Experience acquired on any particular stream, tempered by the size of the fly and the condition of the water, will be the best guide as to the arrangement of your wet fly cast.

Spinning for Trout in the Summer Months

The scientific improvements which have been made in spinning reels, rods, lines and lures, are rapidly bringing that method of fishing more and more into popular favour.

Spinning for trout, however, has not advanced so rapidly as spinning for salmon, and the reason is not far to seek. It lies in the fact that dry fly fishing for trout, comparing it with fly fishing for salmon, is infinitely more interesting.

As certain of our rivers and streams hold trout whose size renders their presence undesirable—first, because their food consists principally of members of their own species, and secondly, because it does not consist of the flying varieties of water insects—a few words on that by no means easy method of angling, *viz.*, spinning for trout in the summer months, may be welcome to my readers.

I am not for the moment alluding to spinning for trout during the colder months of the year. There is a great and distinctive difference between the man who uses a minnow in the discoloured water of the early spring months, and who allows the tumble and rush of the river in which his lure is cast to do the work for him, and the man who delights in the difficulty of catching his trout in the dead, low, clear water of the summer time. The greater difficulty and the more interest must centre in spinning during the summer, and when the lure is used in clear water, in perhaps an almost empty stream and in the blazing sun. The lure may be used either in searching the shallows of our smaller streams, or thrown far out beyond the reach of the dry fly man and into the rapid runs and glides of our larger rivers ; and whether it is the natural minnow with tackle consisting of at most two triangles, a lip hook, and the finest of traces, which is extended by the rod from a slack line held in the hand of the fisherman, or an artificial spinning minnow,

thrown from the latest and most improved form of spinning reel—the sport is most enjoyable.

I will first of all discuss the method of upstream fishing in low, clear water, with a natural minnow and the lightest of tackle.

The Single-handed Spinning Rod and Reel

The rod to be used when spinning, whether a single or double-handed one, should have an action similar to a very stiff fly rod, but should be furnished with fewer and larger line rings.

The reel to be used will depend on the manner of casting. If casting from the hand, an ordinary fly reel is perfectly suitable, but if casting from the reel, some form of Nottingham reel will be necessary.

The line should be silk, very carefully dressed, or—which I prefer—an undressed silk line, as fine as is consistent with the work for which it is required.

The trace should be from one to one and a half yards in length, and furnished with at least two double swivels.

Spinning flights are supplied in many different patterns, and it is therefore impracticable to describe them, but in my opinion the fewer hooks the better. When the natural minnow is used, it should be small, not more than two inches in length, and as bright and fresh as is obtainable.

The method of spinning from the hand is as follows :—The minnow should be held in the left hand, and should not reach below the reel when the rod is upright. A certain amount of slack line should be drawn off the reel—say a couple of yards—and should be held by the middle finger of the right hand against the handle—that is when the right hand is holding the rod. The rod should then be raised

from the horizontal position and switched outward and upward, and at the same time the left hand should relinquish the lure, which will swing outward, and as it reaches the end of its swing the slack line can be released by relaxing the pressure of the middle finger of the right hand. As the bait shoots forward to its destination the rod should be lowered.

The motion imparted to the lure by the movement of the rod will give it enough impetus to draw the slack line through the rings; in other words, the weight of the lure will, by the upward swing of the rod, be great enough to shoot the slack line which has been retained by the right middle finger.

The lure should be cast up-stream with as light and delicate an action as possible, and directly the bait has entered the water it should be drawn in again by the left hand, and brought across or down stream, every place likely to harbour a trout being carefully searched. The lure should be allowed to sink as deeply as possible without actually touching the bottom.

Having once become capable of casting delicately with this short length of line—which, however, is generally sufficient when wading and fishing up-stream—you can, in order to command a larger area of water, gradually learn to draw off more slack line, holding it in three or four coils over the different fingers of the left hand.

Lead may have to be used for the purpose of sinking the bait, but the smaller the quantity used the better. The tackle should be always of the very finest character.

Casting from the Reel

Casting from the reel necessitates a steady side swing of the rod, but more lead will have to be used with the lure than when casting with the slack line, as inertia and the

frictional resistance of the drum on its spindle will have to be overcome.*

In casting from the reel the bait is not held in the left hand, but suspended about three or four feet below the top ring, the rod being brought steadily back and sideways, and the forward cast made with a steady switching action from the elbow round sideways and forward. As the bait attains centrifugal speed the drum of the reel is allowed to rotate freely.

With the old-fashioned Nottingham reel the drum is prevented from revolving by one of the fingers of the left hand, and is released at the required moment; the finger again acquiring a slightly checking control in order to prevent over running as the bait flies forward to its destination, and it eventually stops the rotating action of the drum as the lure touches the water.

The minnow, whether artificial or natural, is then worked through the water, being again allowed to sink as deeply as is safe, the line being reeled up in order to keep the lure off the bottom and to give it its necessary speed through the water, the rod being kept well down and assisting the reel in this object.

This manner of casting is of course the better, as the fish, when hooked, is at once in play from the reel instead of from loose coils, but it is more difficult to learn owing to the tendency of the reel to over-run. It is also more difficult to throw accurately in the desired direction.

When fishing with any variation of the spinning reel, the lure can be cast much further—either up-stream, across stream, or down stream—and worked in the best possible manner to secure the attention of the fish.

* It is right that mention should be made here of the excellent principle embodied in the Illingworth reel, which is thoroughly suitable to this method of spinning.

When angling for large fish the more slowly and the more directly the bait can be brought to their notice the better.

Natural minnows, artificial minnows, and spoon baits can be used for this method of spinning.

The advantages of spinning across and down stream are these: a much slower method can be adopted, and the pressure of the down-stream current will assist the spinning of the spoon, the minnow, etc.

I am dealing now almost exclusively with the spinning during *fine weather*, and in clear water, and therefore I wish again to impress on the fisherman the necessity of using as light a lure and lead as possible. Many artificial lures, such as that excellent one—the Reflet Minnow,* patented by Messrs. Wyers Frêres—are sufficiently heavy in themselves.

If it be true that the great majority of fishermen consider that the present method of arming the natural or artificial minnow with a number of triangle hooks is prejudicial to the best interests of sport, then I think they would welcome laws which prohibited the use of more than one hook to each lure, or at least more than one triangle to each lure. Quite apart from the fact that a number of triangles lead to the lure being repeatedly caught in the weeds, snags, etc., etc., the fish which are caught are very frequently unable to make a fight for their lives, both their upper and their lower jaws being firmly locked together by these triangles, and when they succeed in escaping they are so badly mutilated that they cannot possibly recover.

I was watching a fisherman spinning on the Wye a little time ago, and he got into a good sized fish. He brought the fish nearly up to his landing net when it got away, and on one of the triangles of the lure we found the eye of the fish, which happened to be a chub. Evidently the chub had

* This can be obtained from Messrs. G. Little and Co., 63, Haymarket, S.W.

been hooked in the mouth by one of the upper triangles, and the tail triangle must have swung over and caught its eye.

Ambidexterity in Casting a Fly

The student should be able to use either hand when manipulating his rod. There is fortunately no difficulty in doing this when once the mental process of casting is acquired. Many a good rising fish and many a difficult but likely spot in the stream may be reached by him alone who can cast with either hand.

There is always the danger of a disabled right or left hand or arm, and even when both arms are sound there are times when a change of hand is not only pleasant but necessary. I remember in 1897, while fishing on the Wutach, getting an acute attack of fisherman's elbow in my right arm, and for several days at a time the ability to use my left hand in casting enabled me to enjoy my sport with comfort and pleasure, when to use my right hand gave me considerable pain.

Knots used in Trout Fishing

Hardly a book on fishing has been written which has not dealt with the subject of the knots which are used by fishermen when fastening the line to the casts, fastening two parts of a broken cast together, attaching a dropper to the cast or the gut to the hook. It is, however, desirable, while treating this subject fully, to do so in as simple a manner as possible.

The overhand knot is the easiest of all knots (see Diag. 4, Fig. 3) and yet it is one on which practically all other knots are based. The best method, in my opinion, and the one I recommend for attaching an end of gut to an eyed hook (see Fig. 2) is to pass the end of the gut

through the eye of the fly, and then to form an overhand knot round the unthreaded portion of the gut, so that the end lies alongside and pointing up the cast, away from the hook (see Diagram 4, Fig. 2, and Diagram 5, Fig. 4). The overhand knot thus made, is drawn tight and is then pulled down towards the eye of the fly, and its end cut off, (see Fig. 2, Diagram 4).

This forms the safest knot which can be used on small flies, and is the one which I have used and advocated for

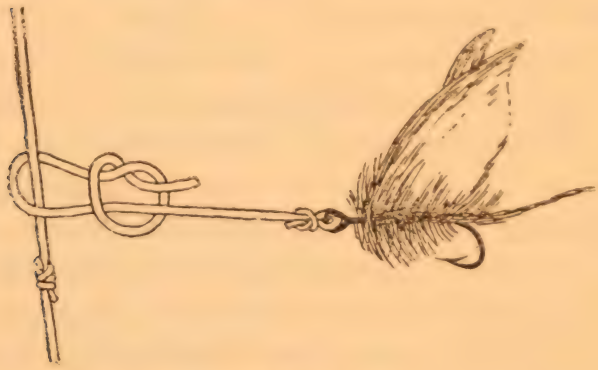


FIG. 1.

FIG. 2.

FIG. 3.

DIAGRAM 4.

FIG. 1.—Method of attaching dropper to line.
FIG. 2.—Overhand knot drawn taut on the eye of hook.
FIG. 3.—Overhand knot loose.

many years to all whom I have coached. In the patent fibres which are now being sold in place of gut this overhand knot should be made with two instead of one turn to its end. This fibre appears to me to possess many advantages, but one of its disadvantages is that when

wetted it becomes very soapy, and unless some precautions are taken the knots made in it will slip.

There is a knot which is known to the sailor as the half-hitch, which is shown in Diagram 5, Fig. 6. If this half-hitch is slipped down over the eye of the fly, and drawn taut, the knot shown in Diagram 5, Fig. 7, results. If this knot is used with small hooks, or ones in which the wings are close to the eye, it is a difficult matter to avoid injuring the wings of the fly. It will be seen by Diagram 5, Fig. 7,

Fig. 4.

Fig. 5

Fig. 6.

Fig. 7.

DIAGRAM 5.

FIG. 4.—Overhand knot tied round unthreaded part of cast.
FIG. 5.—The same slipped over eye and drawn taut, forming the sheet bend.
FIG. 6.—The half-hitch.
FIG. 7.—The half-hitch after it is slipped over eye and drawn taut.

that the end of the line will lie down close alongside the body of the fly. The disadvantages of this knot, however, are, first, the difficulty of securing it to the hook without injuring the fly, and, secondly, that the fly cannot move independently

of the gut to which it is attached, as it does in the knot which I recommend. If the eye of the fly should be made of gut, as the eye of a salmon fly frequently is, the overhand knot shown in Figure 3 can be slipped down while loose over the eye as shown in Figure 4, and drawn taut, the result of which is shown in Diagram 5, Fig 5, and is known to the sailorman as the "sheet bend." Where patent fibre is used with the gut eyed salmon hooks, a small knot should be made in the end of the line, which will prevent the fibre from drawing, or, in the case of gut, the end can be passed again round the shank of the hook and under the part which runs through the eye. This is called a double "sheet bend"

DIAGRAM 6
Showing a method of using the overhand knot for large flies.

by the sailorman. This knot, in my opinion, is a fairly good one for the wet fly fisherman, but a bubble of air is frequently retained by the short end above the eye of the hook, which gives an unnatural appearance to the artificial fly.

For hooks larger than No. 3 the overhand knot can be made round the threaded part of the gut, and not, as in Figure 4, round the unthreaded part. The knot is then drawn taut, and the end cut off short. The noose thus formed is drawn taut on the unthreaded part, and is

then pulled down, so that the knot thus made slips down to the eye of the hook.

If two ends have to be joined, one overhand knot is tied in one end, and the other part passed through this knot, and then tied in an overhand knot round the other part (see Diagram 7). Notice how the ends come out. All that remains to be done is to draw these two overhand knots taut on the piece of gut they enclose, and then draw the two knots together. This makes the neatest of all joins, but for additional security, and so that the end of the gut can be cut absolutely short, a double turn of the end can be made in each overhand knot before it is drawn taut.

When attaching a dropper to a cast, the best way is to make a fairly large overhand knot in the short end of gut

DIAGRAM 7.

Showing the method of joining the ends of two pieces of gut with overhand knots.

attached to the fly, and to pass the fly through this knot, enclosing the cast in the loop thus formed. The overhand knot is then drawn taut, and the loop is then placed at the spot at which the dropper has to hang, the loop closed by pulling on the fly, and the end cut short off (see Diagram 4, Fig. 1).

The best method of fastening your line to the end loop of the gut cast is to thread the end of the line through the eye, bringing it round both parts of the eye, and slipping it underneath its own part. This again gives the "sheet bend" (Diag. 5, Fig. 5). A small knot in the end of the line

makes this "sheet bend" absolutely secure, and permits of an attachment which can be instantly released.*

Sex in Trout

The cock fish may generally be distinguished from the female during the spawning season by the fact that the adipose fin is more developed, thicker and stiffer than in the hen fish.

During the open season the reader may probably find it difficult to distinguish between the sexes of the trout. As before stated, it is claimed that the cock fish has a longer and stouter adipose fin ; there is a bluntness about the nose and head of a male fish, although this bluntness is lost as the spawning season approaches. At this time the colour becomes more vivid on the sides ; and the belly of the fish, both before and behind the ventral fin, has a decidedly square appearance in the cock fish. The hen fish at this time loses some of her colour, and grows big with spawn, but does not acquire the squareness in the underneath part of its body peculiar to the other sex.

The Appearance of Trout

The colour of the trout changes rapidly in relation to its surroundings. If a dark trout be taken from under a bridge or from some deep shady portion of the river, and placed in a shallow enclosure with light-coloured gravel at the bottom, he will, before many hours have elapsed, have changed to a much lighter colour. A trout which inhabits a river one side of which is deep, over-shadowed, and with a dark bottom, will when on that side of the river be possessed of a dark colour ; but if he should during certain hours of the day cross the river and lie on the opposite side in sunlight, on a shallow, gravelly bed, he will rapidly become lighter.

* For a description of other knots see Chapter XVI.

Weeds

It may well be asked! If these weeds are so dangerous and so often rob the fisherman of his fish, why are they left in the river?

There are several considerations which have to be taken into account with reference to the water plants or weeds in a trout stream. The owner has to consider the necessity of keeping open his water way and preventing these rapid-growing plants from choking up the channel of his stream, a fault which would lead to the flooding of the adjacent property, damage to the river-banks, and the probable loss of many good fish.

On the other hand, he has to remember that these weeds, when kept within certain bounds, are most beneficial to trout life. They keep down the temperature of the water and are a refuge to the trout, not only from mankind, but from the otter, the heron, and other enemies; they provide a never-failing supply of natural food, as well as acting as filters and natural purifiers of the waters in which they exist. The Ephemeridæ and other water insects are always plentiful in weedy rivers. The fresh-water shrimp, one of the principal foods of the trout, abounds and multiplies amid the shelter of the weeds. Several trout-breeding establishments make a regular business not only of supplying fly larvæ, fresh-water shrimps, and other water insect life, but of cultivating and supplying the best weeds and water bushes for trout streams. Riparian owners, therefore, who wish to afford shelter or create a natural food-supply for their fish would do well to remember this fact.

The Riparian owner must also take into consideration the valuable effect which the water plants have in checking the down-stream flow of water in the dry seasons, and by this natural damming action keeping a plentiful supply of water in streams which would otherwise soon run very

low (see Plate XII.). The photograph shown in this plate was taken on the Axe, Devonshire, and the influence of the weeds on this stream can be at once realized, both as regards the plentiful supply of insect life and as damming up and filtering the water of the river.

Weed-cutting and dredging should always, therefore, for the above reasons, be restricted within reasonable limits, and carried out at times most convenient to other fishermen. Nearly every owner of trout water has suffered from the ills of floating weeds, and this experience generally leads to the kindly consideration of those who may be fishing in the water below them. The weeds which encourage the growth of the water shrimp—perhaps the most valuable natural food for trout—are the Ranunculus and Water Celery.

Fungus on Grown Fish

A trout may be caught at times suffering from a fungus or a growth on the head, shoulder, or other part of the body. The student will be well advised, after netting such a specimen, to destroy it at once, taking care not to return it to the water or place it among his clean fish. Fungus can at times be cured by dipping the fish in a strong solution of salt.

It is the salt in the sea water which effectually eradicates the germs from the wounds which a salmon receives during a futile effort to reach the spawning ground, and by doing so makes practically certain the ultimate cure of such wounds. Ordinary fungus is a growth which attaches itself to any bare spot on the trout's skin, caused by a wound or the accidental loss of slime. The natural mucus on a trout protects the skin from fungus in exactly the same manner that Peacock's Paint protects the bottoms of iron ships from barnacles, etc. The fungus is in itself harmless, but it

[*Photo by the Author.*

A Natural Dam of Weeds.

AT THE MEETING OF TWO CHANNELS OF THE AXE. SEATON JUNCTION.

Copyright.]

sometimes contains worm-like parasites of microscopic character. These attach themselves to a portion of the fungus near the skin of the trout, and are continually eating into the tissue of the fish. The mouths of these worms are armed with tentacles, with which they can adhere to any portion of the trout's skin which may be unprotected by slime.*

If the worms be killed by salt solution, the fungus then disappears. If, however, any portion of the living and malignant fungus be returned to the water, it will carry with it a percentage of these deadly and contagious worms; hence the necessity of its destruction to insure the protection of the healthy trout in the same stream. The bare places caused by the fry nibbling one another are an ever-present source of danger to these small fish.

Hints as to the Selection of the Fly when by the Water-side

So long as the fisherman has from eight to twelve of each of the flies which are likely to be on the water which he is going to fish, his only difficulty will then be the determination of which fly to use. When he reaches the river, he should as soon as possible find out which fly is being taken.

It is just here that the utility of a small, light, and collapsible butterfly net must be again emphasized; no article, after the rod, the line and flies, the reel and the fishing-net, is more important to the dry fly fisherman. It is always difficult, and often impossible, to catch the elusive winged insects which are flying or floating rapidly past without such a net. With a net, however, little or no time is lost, and fly after fly can be easily and quickly netted and examined and then compared with the artificial flies in the student's

* See Black fish, page 43.

fly-box, until he has finally determined on the correct fly to use.

One of the difficulties which the beginner will experience is to determine the size of the flies he wants when ordering them from the makers. The new numbering of flies which commences from 000, 00, 0, 1, 2, 3, 4, etc., are those commonly used. In order to facilitate matters, I have engraved these exact sizes in facsimile on the side of the fly fishing knife previously mentioned. When, therefore, a fly is caught by the brookside, if it be placed exactly over one of the engraved hooks, the student will see at once the size of the fly he has to order. By wiring the number and name of the fly to the maker who supplies him, thus: "Send me by first post one dozen Red Quill size 0——" he will be able to get them by first post.

The Cap as a Fly-Holder

A good place to keep the fly which you have just taken off your line is undoubtedly the cap. In this position the flies dry quickly, are secure, out of danger, and always very handy. The flies placed in the cap during the day can be sorted and replaced in your fly-book or fly-box when you get home. The only drawback to this plan is that in wet weather the hooks, if allowed to remain in the cap as they dry, are likely to rust. Flies in the cap are also apt to excite attention, and hints from friendly strangers that "Your hat, sir, is covered with feathers," etc., have been frequent. When I was coming home from fishing one day on the top of a tramcar, a fond mother kept her children quiet for some time by an entomological discussion as to the nature of the "tame" flies grouped on my fishing-cap, and a droll remark was made by a newspaper boy, who, when offering me an evening paper, said "Hexcuse me, Sir, but your 'at is hall hover hinsecks!"

Dry Fly Fishing with Three Flies

Now we will suppose you have just arrived for the first time at a stream for a few days' fishing. It is an ordinary trout brook, and you may not have any one with you to suggest the correct fly with which to fish.

Your *Field* or *Fishing Gazette* may have told you that Black Gnat, the Blue Quill, and Olive Quill are being taken on the water. But there are *no flies visible*, and the trout are not rising. How, then, are you going to determine the correct fly to use? It is by no means a bad plan—although not usually adopted—in order to save time, to place one of these flies, say the Olive Quill, on the end of your cast; then, three feet up the cast, with a very short end, attach the Blue Quill, and again, three feet further up, a Black Gnat. Oil the cast and each fly, and treat this cast of three flies as you would a single dry fly cast, and fish up-stream. I have often, by adopting this method and fishing the likely spots, discovered a fly which the fish will take, and by discarding the other two and fishing dry fly with the remaining one, have saved much time and caught fish which I should not otherwise have taken.

Even when the fish are rising, it is often difficult to find out the definite fly which they are taking, and when, for experimental purposes, you may, as above advised, be fishing with three dry flies and happen to catch a rising fish, examine the food in the upper part of its gullet. This can be done by a gentle upward pressure along the body towards the gills, which will express the latest taken food into the mouth. The chances are that the sub-imago form of some water insect will be found there, as well as the pupæ of the same insect, and if the fly on which you have taken this fish does not secure you trout when it is fished as a single dry fly, try a specimen of the sub-imago found in the fish's gullet.

There are many days, mostly in fine weather, with clear calm water, which require the floating fly to be in the most perfect condition possible, while on a few other days, and in perhaps rougher water, the more fluffy and knocked about the fly be, the more deadly it appears to become.

When hesitating as to the size of any fly it is better to choose the larger size, even on such educated waters as the Itchen and the Test.

But it must also be remembered that educated trout may easily be " put down " by a fly larger or smaller than the natural fly on which they are feeding.

Moths and Otters

Moths constitute a very real danger to the security of all artificial flies, and during the off season camphor should be freely used.

" Otters is pisen whenever met." They are carnivorous, and those which inhabit or visit trout lakes and streams exact a toll from these waters, which is thorough and destructive. Otters, in any particular stream, may eat, and may even prefer, the frog and the eel to the trout. Evidence on this point is, however, very meagre and one-sided, but what about the stream which supports trout only ? Even with a partiality for partridge, I have known people in the close season content themselves with spring chicken.

The Broken Rod

The fisherman is likely at some time or other to fracture or spring the upper or middle joint of his fishing-rod, the handle of his fishing-net, etc.

If he should happen to meet with this misfortune he

can with very little loss of time and without difficulty repair the most serious fracture or injury.

The best plan to adopt to meet such emergencies is to have in your creel a roll of quarter-inch adhesive plaster and a few strong quills. By splitting the quills and opening them out they can be used as splints, and with the adhesive plaster will effectually repair the broken rod.

If the rod be a cane one, it will not be likely to break, but merely to spring, most often in two or three segments on one side. In such a case, place two quills on the weaker side of the rod and one on the other. These, combined with a good strong whipping of the plaster, will render your rod perfectly fit for use. If you care to make a neater job when you reach your fishing quarters at night, a little hot water will loosen the plaster, and you can then make a more perfect mend of the break, sufficient indeed to last until you see your rod-maker again.

It may be necessary to place more than one layer of the quills on the rod, but as they fit closely together and are very light, they do not interfere with the pleasurable use of the rod. The quills can be softened by soaking them in hot water.

If you have not broken a part of your own rod, others may not have been so lucky, and you can help them, and, as the revered father of Huck Finn said, "a good action ain't never forgot."

The value of this method of splicing or fishing a rod is that it is usable directly the plaster whipping has been applied.

Hints.—Whipping a Broken Rod

When adhesive plaster is not obtainable the whipping should be made with strong waxed thread or silk, and finished as the whipping at the end of a rope is finished by

sailormen. The first few turns are made at the desired spot, laid evenly and firmly over the short end of the whipping material, and continued until sufficient turns of the thread have been laid on to cover the injured portion of the rod. The last three or four turns are then loosened freely, and the end of the line with which you have been working is passed under these, and up and out over the turns which have not been loosened. The loosened turns, beginning at the inside one, are then again drawn on taut, and the slack line is finally pulled through under them and the end cut off. The whipping thus finished securely is the most convenient method of neatly and securely placing a whipping on a rod. See Plate XXXIV., Figs. 1, 2 and 3.

Bulging Trout

Trout may at times—such times being generally bad for the dry fly fisherman—be seen feeding on the nymphæ of water insects. On these occasions, although the trout are rising to the surface, they take little or no notice of the natural or artificial fly *on* the water. When the trout are showing the dorsal fin and part of the back above the water, they are then said to be bulging. If the fisherman finds that the trout, in these circumstances, persistently refuse to feed on the floating fly, his best plan is to change his cast, and fish up and across stream with a short line and two or more hackle-winged flies. These flies should, if possible, resemble the nymphæ on which the trout are feeding, and should only be sunk a few inches below the surface, the spasmodic swimming action of the nymphæ being imitated as closely as possible by a series of very small jerks given to the artificial fly as the cast is drawn through the water toward the fisherman.

I have found that a hackle medium Olive Quill is very

useful. On one occasion, when fishing on a delightful chalk stream in Normandy, I gave up any attempt to attract the fish, which were showing up in all directions, with the dry fly, and by adopting the above method secured quite a respectable basket of fish. I have since then, under bulging conditions, tried a Gold-ribbed Hare's Ear, also a Greenwell's Glory, and think the reader will find either of these flies well worth trying, the gold ribbing being most likely the attraction. Alders, or Coch y Bondhu can at times be used with success when trout are persistently bulging.

Keeping the Line Clear

A word as to casting and fishing when daylight has ceased and before the moon makes her appearance. In order to keep your line clear in casting, bring the rod back a little to the left of the vertical, and return it slightly to the right, or *vice versâ*. This should effectually prevent fouling, always allowing plenty of time for the line to extend itself behind. The line should, however, be drawn through the fingers every few minutes, in order to make certain that it has not fouled. When a breeze is blowing across your line, always bring your rod back slightly to leeward, and return it slightly to windward of the vertical plane in which you would otherwise cast.

Changing the Fly after Dark

Now as to the greatest difficulty of all—the changing or replacing of trout flies on the cast after dark. This is a difficulty which has on more than one occasion robbed me of the charm of redeeming the ill-fortune of a poor day, when the very audible but invisible activity of the trout was telling me of a long delayed and anxiously expected rise.

In the dusk, with no lantern and no one to help, the chances of replacing a lost fly are infinitesimal. A small portable electric light is being sold which effectually overcomes this difficulty. This lamp can be suspended round the neck, lies flat on the breast, and, when turned on by means of a switch, sheds a bright and constant beam of light full on the hands, etc. It is cheap, and has a two-candle power lamp, lasting for hours. It can be recharged by dry cells in less than two minutes. This light is only wanted at rare intervals, and never for more than three or four minutes; its use permits the angler to continue his fishing however dark the evening may be.*

* This lamp is sold by Messrs. Holtzapffel & Co., 53, Haymarket, S.W.

CHAPTER VIII

AXIOMS, NOTES AND THEORIES—GRAYLING FISHING

Hints to the student—Axioms and advice on sundry fishing matters—Loch and lake fishing—Grayling.

Hints to the Student

Experience and common-sense are the most valuable guides when actually fishing. No two days are alike, and at each step the fisherman will most likely be confronted with an absolutely new combination of circumstances. This is perhaps one of the greatest charms of dry fly fishing. To read is good, because it shows from the personal knowledge of others that no two experiences of the same writer are absolutely alike, and no hard-and-fast axioms of fishing lore can invariably be followed. The attendant circumstances should guide the immediate actions of the moment.

There are, however, certain truths and axioms which occur to me and which the beginner might do well to remember; they may perhaps be tinged with a personal colour, for they are the results of my own fishing experience.

The fisherman should always remember that nothing succeeds like success, and if he believes in the fly he is using he is more likely to be successful than if he is doubtful as to its virtues. The suggestion that the fly he is using must be the best assists him while fishing. I can even imagine a day's salmon fishing to be interesting from start to finish in spite of the fact that no salmon have come at the fly, if the fisherman himself believes that his fly is the only one that will kill at the time.

It really means that the suggestion of infallibility aids the fisherman in that continuation of attention which is so necessary to the purpose in hand, *i.e.*, to attract the attention of the fish. I think myself that there is no fly like my own "Fancy," and while a certain amount of optimism may be allowed because of the success I have attained with it, at the back of my brain I know full well that some at least of its success is due to the suggestion of its infallibility.

The beginner, he who has been badly taught, or the self-taught man who may have acquired bad habits, fails to understand why his friend catches readily and easily fish after fish, during a long day, while he secures but a few, if any.

The skilful fly fisherman, who can take every rising fish within his reach, seldom attributes his success or his friend's failure to the real cause, which is, the certain and immediate skilfulness or unskilfulness of each cast.

The dry fly fisherman, for instance, has, as a rule, only one opportunity at each fish, and it is with him that the making or marring of that chance rests. Each initial cast for a trout possesses a greater or less difficulty, and his success will depend on the immediate and skilful manner in which he takes advantage of the opportunity.

The most essential portion of the dry fly fisherman's art, and the most difficult to acquire, is the power to place at once and with certainty the right fly, delicately and accurately, over his fish.

Axioms

Among the many factors which contribute to the happiness of any day's fishing, the killing of the fish is an incident which ranks least.

The best fisherman in my opinion is he who nets most fish, and who kills or injures the least.

There can be no harm in filling one's creel if its contents are employed in "pleasuring some poor body" as Izaak Walton has it, but to effect the depletion of a trout stream for no other purpose than that of proving one's skill, and to toil during the day under a creel loaded with those beautiful fish in order to establish our own prowess on our return to our fishing quarters, is a vanity which calm consideration should soon permit us to conquer.

A fisherman's day may be considered to be one on which trout are difficult to capture. A duffer's day may be considered to be one on which the fish are superlatively easy to capture.

It should always be remembered that the killing of a two or three year old fish puts an end to the most valuable and interesting period of its life.

Always be charitable; never discredit a reputed trout stream because you have been unlucky on one or two occasions. "No fish in the river" is a rash statement to advance, because, after one or two visits, no fish have been caught, or possibly seen. A futile visit to a stream and a hasty opinion thus formed may be regretted. I remember, by the kindly courtesy of a French landowner in Normandy, taking a day on his stream, in which he told me were many trout. I had been doing well all the week, but on this day I had the poorest luck, and, therefore, hastily concluded that the stream was almost barren of trout. Consequently, on one memorable day on which the May-fly was dominant, instead of going with a friend who was fishing this stream, I went farther and fared worse, and found, on meeting my friend in the evening, that he had enjoyed a glorious day's trouting. I still regret losing that excellent day, and consider that, as regards any water, first impressions are not always the soundest.

The golden hours of a trout fisherman's experience will be from 10 a.m. to 3 p.m.

It is during their first rise, *i.e.*, during the period when they first come on the feed on any day, that most trout will probably be taken. You may miss this rise!

As the big fish rise most frequently in a slow and dignified manner, their rise is generally of a less disturbing character than that of a young, eager and voracious youngster. The splash made by a big fish may be less, but the wave will probably be bigger; nevertheless to the unobservant or inexperienced fisherman the difference is not easily discernible. The musical, sucking noise of the big fish, when feeding at night on surface food, is unmistakable.

Do not press in fly casting. Use the least possible force in order to achieve your best cast.

If it be possible always keep a taut line after a fish is hooked.

Play your fish from the reel if possible.

Keep your rod well up when playing the fish.

A constant and delicate strain on the line secures a lightly hooked trout, which otherwise would be lost.

Always remember that in very weedy water it is better to let a trout go up-stream into the tail of a bunch of weeds than to pull him down-stream, and let him get sideways into the thick of such a danger. A fish which may seem hopelessly entangled in weeds and brushwood may with patience and nerve be ultimately creeled.*

When about to net or gaff your fish, use your reel as little as possible.

* See page 53, *re* Weeds and Handlining.

Your man, your rod, your reel, and yourself, should be as still as a heron at that critical moment.

Look to the point of your trout and salmon hook frequently, and always carry a small file in case the point becomes blunted.

Avoid casting directly over a trout if possible, but get your fly above and within range of the trout's vision as soon as possible after one has risen.

In the ordinary run of a stream when a trout is seen rising, so long as a fly floats into the circle which bounds its upward vision (see Diagram 2), and so long as the line does not immediately bisect the circle when fishing upstream, the angler may rest assured that he has done all he can do when he casts to a spot immediately above the circle of the rising fish. If immediately below your fish the line can be thrown in a curve, so that while the fly alights immediately above your trout, the line will curl over to the right or left of the trout's position. As the cast falls on and breaks the surface of the water, it will be visible to the trout, but it is not so likely to scare the fish as if it had fallen immediately over its head. (See the drag, page 197).

Run your dry fly line through your grease pad at least twice during the day's fishing—but only when the line is dry—once before you start, and once after the pause for luncheon—take off any superfluous grease by running the line through your handkerchief or any dry rag.

If too much grease be put on the line, it hinders its easy running through the rings of the rod.

Keep the point of your rod down when fishing.

The less slack line there is between your rod point and the fly, the better will be your strike and the greater your command over the fish you hook.

Unreel your line every night and let it dry.

Keep the ratchet wheel of your reel clean and well oiled, and the spindle clean and just sufficiently oiled to allow the drum to run smoothly.

Gut Casts

Gut Casts which have been lying in the damping box all day should be placed in dry flannel at night, and gut should be soaked, carefully tested and examined before being used.

The length of the gut cast used in dry fly fishing should be about nine feet. I have never found it necessary to use longer ones.

When the fisherman is casting correctly, he will sometimes find that the last few inches of his nine foot gut cast will not be properly extended and will fall backward on itself; and in such a case he should shorten the length of his cast by a few inches and carefully note the result. Such a fault is, I think, frequently due to the faulty—though undetectable—tapering, or construction of the taper of his gut points with which the cast is made. I have invariably been able, in a few experimental casts, to correct this fault by slightly altering the length of the cast.

It is always advisable to test old casts before throwing them away. If the gut has not been exposed to daylight it will be found that by soaking it in a solution consisting of water and about ten per cent. of glycerine its usefulness may be restored.

The last season's gut is sometimes treated to a judicious soaking in such a solution.

I have found the best material for floating a line, or a cast, to be hippopotamus fat, but if this be not obtainable, mutton fat is the cheapest and best grease to take with one for applying to the line. It certainly cannot in any way

injure the lasting qualities of the tapered fishing line or gut, while being all that can be desired for preserving the line and making it buoyant.

The best method of detecting faulty gut, or a cast that has been weakened in the tying, is by first looking to see if any white spots or glints are showing in the material of the gut itself, and secondly, by bending the gut between the two hands at each knot. If the gut is cracked, or has become weakened, the curve of the gut in the bend will not as a rule be regular.

Although an old cast may appear to be quite sound before being used, after being soaked for half an hour it will sometimes part with surprising ease, and therefore a test on the strength of the gut should always be made, after it has been carefully soaked.

The Trout Fly Rod

A perfect trout fly rod should be good for both the wet and the dry fly methods of casting. A rod whose action is centred at or near the spot whereon the ball of the thumb is placed, will communicate to the wet fly fisherman the most delicate touch by the fish at the fly, and because the thumb attention is always continuously or subconsciously engaged in holding the rod such a touch will always be instantly appreciated. Where a very whippy rod is used, and when the action of this rod is not so happily situated, a delicate pull by a fish results in a slightly and very gradually increased bend of the rod point, not always observed, for the eye is seldom, in any method of fishing, directed to the rod.

Keep the metal sockets of your rod greased.

Smear your wooden rods with a little mutton fat before putting them away for the close season.

Use the two tops of your fly rod alternately. A convenient way to remember this is to see that the top which has

to be used—when the rod is again put together—is next to the middle joint, when you are putting the rod into its cotton pockets at night.

While the nature of the lure may be varied with conspicuous success during the season, this axiom might and should be remembered—The finer the water, the finer the lure.

Except it be necessary to cast a long line in order to fish some particular spot otherwise unfishable, always keep well within your distance, and avoid fishing a long line, when a shorter line will serve your purpose equally well.

When fishing from the bank of a trout stream in the vicinity of trees, bushes, etc., nothing can excuse negligence in failing to look behind in the plane in which a fresh back cast has to be made. Sailormen have a proverb which runs, " The devil would make a good sailor, if he would look up aloft," and I think fishermen might have an equally trite proverb in—" The devil would make a good fly fisherman if he would only look behind."

Each day on which you fish should most certainly add to your knowledge and experience, and maybe to your skill.

In order to make the best possible forward cast the line should be extended in the backward cast directly away from the spot at which the fly has to fall.

The line follows every movement of the point of the rod.

The name of the method, by which the casting of a fly is known, depends on the manner in which the backward cast is made.

Vim and not violence should be used in casting.

" Attention " is not the recognition of a truth or a fact, but the consideration of it.

The weather may be unpleasant, the fish shy, your luck villainous, but never be discouraged ; your luck must turn, the fish must feed, the sun must shine, and you must catch fish.

Bad luck at the card tables may be ended by a no-trump hand and a big slam. The poorest day's fishing may be concluded with the capture of a record fish.

A perfect trout rod should be one which can project a fly to any reasonable distance, of a taper which will cause an even and gradually increasing curvature in the rod from the hand to the top ring, as it is brought into play, of an action which will make its elasticity merge into that of the forearm, and of a material and construction which will resist the stress of hard work.

Do not use your favourite fly fishing rod or line either for trolling, spinning, or competitive casting, or with a desire to show off your distance casting ability, for your rod will suffer, even though you flatter your *amour-propre* by making a record cast.

One of the many charms of dry fly fishing is the correct solution of problems affecting the first cast of the fly at a rising fish.

Loch Fishing.

In calm weather and during certain hours of the day, the fisherman will be unable to obtain fish by the ordinary manner of casting and fishing his flies, and the following is an excellent means of obtaining fish under such circumstances. The fly or flies should be allowed to sink slowly to the bottom of the loch and when they have rested there for a short time should be raised to the surface by a series of little jerks, and this method repeated will frequently

result in the fish being attracted by the lures as they rise through the water to the surface.

Other circumstances being favourable, the more temperate the water of a trout lake the greater is the supply of water insects, the larger and more numerous the trout.

The rise of trout in a loch or a lake is never of such a regular character as the rise of trout in a stream. The loch trout rise much more slowly, and will often watch a dry fly on the surface of the water for some minutes before attempting to move upwards to investigate it. A dry fly should therefore be allowed to remain on the surface of the water until it sinks. It may then be pulled through, and under the water in a series of little twitches, until it is almost at the angler's feet.

I remember adopting this method on a lake in Ireland (see Plate XIV.) with very great success, for the surface of the water being glassy I secured half my fish by using these tactics.

Grayling.

When comparing the fighting qualities of trout and grayling weight for weight, the former must, without hesitation, be regarded as affording the better sport. That grayling, when in the prime of their condition and when taken in certain rivers, afford most excellent sport is undeniable, but they appear to me to vary in their fighting qualities to a greater degree than trout. Rivers which are rapid, shallow, pebbly, and low in temperature, are those in which I have found them at their best.

Grayling are less conspicuous when in the water than trout, and, unless they are on the feed, their presence in the deeper water of a run or pool is frequently undetected. Even when on the feed they appear to lie at a lower depth than trout, and as they are constantly on the move it is

PLATE XIII.

The Summer Glory of a Chalk Stream. (Test below Romsey.)

PLATE XIV.

An Irish Trout Lake.

always more difficult to locate them. I have killed a far greater number in the smoother portion of a pool than in the rougher water, but I have killed them on the wet fly on the most rapid portions of deep runs in such rivers as the Warg, the Vecla, and other European waters, and at a time when they appeared to be untakable on the quieter portions of the same river.

When on the feed grayling appear to be less discriminating as regards the appearance and movements of the flies presented to them than trout, for though they seem at times to have a strong partiality for a certain fly, or certain flies, they do not seem to be "put down" if the fly or flies presented to them are brought to their notice in a manner which would effectually put down a trout.

When in smooth water they are best taken on the dry fly fished up-stream, and two or three dry flies can without fear of scaring them, and with considerable success, be attached to a nine foot cast. Small flies are most commonly used, but it is quite a mistake to think that the grayling's mouth is not capable of taking the largest size of a trout hook; I have found it by no means a bad plan to put on as a tail fly a Wickham or Olive Blue Dun on a No. 1 size hook, a Red Tag on a No. 0 hook, and a Green Insect on a 00 hook. Fish them as dry flies up a pool, and then down the same pool partly as wet and partly as dry flies.

The disadvantage of fishing down stream is that only one grayling in about every four that rise seems to be secured.

I was fishing on the Tanat not long ago, down stream, with a somewhat similar arrangement of flies on my cast to that given above, and found myself missing grayling after grayling as they rose to my flies, but on getting to the bottom of the pool—in which I had only succeeded in hooking one fish—I dried my cast and fished upstream, only missing two rising fish, and securing no less than eight others.

Grayling take the wet or dry fly whether floating on or slithering along the surface, whether being drawn through or allowed to float down under the surface.

On the head waters of the Vistula and the Dniester, the fly fishermen have a peculiar method of presenting the fly to the grayling. They use a long light rod, and, attached to the end of their line, a light but strong piece of split bamboo about seven inches in length ; they fasten the line to the middle of this bamboo, to each end of which is secured a piece of gut three inches in length, on each of which a fly, either natural or artificial, is fixed. The method of fishing is to keep as much as possible out of sight, and suspend the seven inch split bamboo just above the water, so that the two flies slither along the surface. By moving along the bank, either up or down stream, the flies are thus presented to the fish, and with a considerable amount of success. I did not see enough of the method to warrant my recommending it in place of the dry fly, but it shows that grayling are not easily put down.

The mouth of the grayling is not only smaller, but it is less tough and more easily damaged, than that of the trout, consequently a generally more delicate manner of playing the grayling is necessary. So long as a grayling when hooked is on the upstream side of the fisherman, there is little danger of the fly breaking away from its mouth, but should the grayling get below the fisherman and thus be able to take advantage of the strength of the stream, he will not only show considerable fighting qualities, but is far more likely to break away. He is more easily hooked, I think, than the trout, but also more easily lost on this account ; he certainly feeds on smaller varieties of insect life and more frequently on the larval than on the flying state of these insects.

The best time in the day for grayling fishing during the

first part of the season is from 10 a.m. to 4 p.m., but during October and until the close of the season, the most favourable period is from 11 a.m. till 3 p.m. Sunshiny weather appears to bring the grayling on the feed, and although no grayling may be seen rising, it is worth while fishing very carefully during all the hours above mentioned. No part of a grayling stream should be neglected. Grayling will be found, not only under the banks of the river, in the deeper runs and shallow glides, but also in the most rapid and rougher parts of the stream.

I have found that the best flies to use for grayling are the Red Tag, Orange Tag, Bumble, Green Insect, Olive Quill, Light Blue Dun, and Water Witch. I have never killed grayling save with the fly, but large baskets are made with the worm, gentle, and "Grasshopper," the latter also having several maggots impaled on the hook. The Grasshopper is perhaps the most effective bait, but I do not consider it a very sporting method of fishing.

But the prettiest form of bait fishing for grayling, in my opinion, is with the float. A No. 00 hook, a gentle, and very fine tackle should be used, and with a very light rod, and a spinning reel such as the Illingworth, this method of fishing will afford excellent sport.

Grayling are in season from July until March, but they will rise at the fly at all times, and in the lower portions of the Test and Itchen, during the May fly season, I have found them an unmitigated nuisance. They are best for the table in October and November, and I think during those months they afford the best sport.

I do not think the introduction of grayling into a trout stream is in every case advisable, as they undoubtedly oust the trout to a considerable extent in some rivers, and the quality and number of the trout certainly seem to suffer.*

CHAPTER IX

THE SCIENCE OF CASTING A TROUT FLY.

Necessity of learning to cast—The two principles of casting—How to learn to cast—Casting with the single handed rod—Position when casting—The backward cast—The forward cast—The movements required when casting diagrammatically considered—Practising on the lawn continued—Practising over water—Misapplied force when casting—Wrist and arm action—An appreciation of the above methods.

Necessity of Learning How to Cast

The difficulties which are met with on an ordinary river when fly fishing can always be overcome when one's methods of fly-casting are perfect. It is, therefore, of the greatest importance not only to know how to cast, but how to cast in every style. Bearing this in mind, the reader will, I hope, be induced to devote a little time to the following description of the various casts taught by myself, and if a little patient attention be devoted to the matter it will, I feel assured, repay him.

When actually fishing, the adaptation of a variation of any habit perfectly learnt in order to overcome a new difficulty is better than trying to create an entirely new method in order to surmount any such difficulty. The object of all casting is to get the fly to alight in some desired and definite place. To be able to do this to the best advantage, the line should, in the backward cast, be more or less extended in the air, opposite to the direction in which it has to alight. The smallest backward curve of the line behind the rod will, however, suffice for the forward cast,

should any danger exist immediately at the back of the fisherman.

Natural dangers such as trees, bushes, cliffs, etc., and artificial difficulties, such as telegraph-poles, barbed wire, etc., will prevent at times not only the overhead backward cast from being made, but also many other variations of the curved cast. Yet there will always be one variation at least which can be adopted in order to bring the line sufficiently back to be easily and accurately cast forward. The more completely the line can be thus brought back, the better the result in the forward cast. There is no place from which a fisherman cannot cast his line so long as he can bring his rod to its usual backward angle (see Plate XXV.), and so that, between his rod and the object, a clear plane is open for the line in its forward movement.

The methods of casting with a two-handed rod are identical with those used when casting with a single-handed one, the difference between the two rods being that, instead of the elbow acting as the pivot of the backward and forward cast as in the single-handed rod, the pivot of the double-handed rod is situated at a point midway between the two hands, and so long as these pivotal points are respectively maintained, the upward and backward and the forward and downward motions of the upper hand, and the pivot of the double-handed rod, are respectively similar to the same motion of the hand and the elbow with the single-handed rod (see Diagrams 8, 13, 17).

The Two Principles of Casting

By the term "cast" or "casting," I include all the movements made by a single or double-handed rod in lifting a fly from any one place, and casting it—first, either back to the same place, or—secondly, to any other desired position on the water.

In the first place this means a movement of the rod backward and forward in one plane.

In the second place it means a movement of the rod backward from one plane into some other plane, and forward in the new plane.

Every variety of cast must be grouped under one or other of these two principles, but the second principle, in which the fly is taken from any one position and cast to some other position, permits again of two methods—in one of which two distinct motions are made, as in the Wye cast, see p. 184, and in the other the cast from one plane into some other plane is made in one continuous motion, as in the Spey or Loop casts.

The casts made under the first principle are easily described and drawn, as they are invariably made in one plane. The great difficulty, however, of drawing diagrams relating to any curved casts is that while these casts have to be made in more than one plane, the artist has only one on which he can show them, and for that reason the latter are, diagrammatically, somewhat more difficult to explain.

The casts which come under the first principle include the Overhead cast, with extended back movement of the line, the Side cast, and the Galway cast.

The casts which come under the second principle are the Wye, the Loop, the Switch, and the Spey, or any alteration of a cast from one quarter to another in a single continuous movement; and any cast in which a danger has to be avoided within the radius of the extended backward cast.

First, then, we have to consider the physical efforts which are required in casting.

How to Learn to Cast

The principle of thinking out each movement should be adopted when learning, but not continuously repeated for

more than three or four complete backward and forward casts of the rod—a pause of one or two minutes should then ensue and the process be recommenced. No lesson on one subject should exceed one hour in duration each day, but the mind can be directed to a consideration of the exact actions which constitute each complete backward and forward movement of the rod at as many intervals during the day as opportunity will afford, and the more frequent the repetition of the mental consideration of the exact movements required the sooner will a correct habit be formed. It follows from this that when once a correct idea is established in the mind of the beginner as to what he has to try to do, and the immediate results which will follow his doing this correctly, he will with very little difficulty acquire as a habit the basis on which correct casting rests, which is the ability to extend the fly backward and forward.

To ascertain the correct action of the hand which grasps the rod, when projecting the fly in the forward and backward casts, is the first and most important matter for consideration.

Every action deliberately performed in response to desire is made by muscles consciously or subconsciously controlled, and before they can be subconsciously controlled, i.e., before the action becomes a habit, the brain cells, or cell controlling the particular muscles which produce the action, must be educated by carefully repeated mental consideration of the exact movement or movements which will effect the object of our desire. The more resolutely we adhere to the habit of thinking out fully any movement we have to make before allowing ourselves to make it, the more quickly will a correct habit be acquired, and the more readily can we perform such an action without conscious effort.

Casting with the Single-handed Rod

When learning to cast a fly it is advisable to do so over grass and not over water, because, when casting on a lawn no difficulties other than those of acquiring a correct habit in casting will be encountered. The line, when projected forward, will lie on the grass, and no matter how long it be left there, it will not alter its position, or become any more difficult to manipulate by the delay, and the attention can thus be given solely to the thoughts which must accompany fly casting.

If the initial attempts to cast a fly are made over water the difficulties will be increased by the fact that the line and fly will sink below the surface whenever a pause is made after making the forward cast, and the attention is thus detracted by having to reel up the line, or otherwise to get it above the surface, and to again extend it prior to the backward cast.

In the preliminary practice any old rod, reel and line can be used, provided that the rod is not too heavy, and that the line be tapered and suitable to the rod. The student should not purchase a rod until he has acquired the art of extending a straight and accurate line. When he is able to do this, he will then be better able to select a rod to suit his strength and his requirements.

I am going to assume that the reader knows how to put a rod together, to place the reel on the rod, and thread the line; but just here a word as to the reel—and I am now speaking to the right-handed fisherman. Always use your left hand for manipulating the reel—that is, have the reel fixed on the rod so that its handle is pointing towards the left hand when the rod is being used. It is quite a simple matter to learn to use the reel with the left hand, and it is of infinite advantage to the fisherman. The rod can thus be always retained in the right hand after striking a fish,

avoiding the risky and, in my opinion, unnecessary changing of the rod from right to left hand when a fish is hooked, and leaving the left hand free at all times for the landing-net, for manipulating the line and reel, for one's pipe, etc.

The rod and line being now ready, take your stand in the middle of the lawn. The rod should be in your right hand, pointing forward, the reel being on its lower side, and your hand firmly grasping the butt, with the thumb extending along the upper side.

Position when Casting

The position of your body should be as follows (see Plate XVI.). The right foot is advanced and pointing in the direction of your line, the left foot slightly behind and pointing to the left, the weight of the body resting on both feet, the right shoulder forward, and the body erect.

The upper part of the right arm should point downwards, with the elbow slightly in advance of the body, and the forearm be extended in the same direction as the rod, which latter must be held firmly and pointing nearly horizontally (see Plate XVI.).

The Backward Cast

Now the object you should have in view is to learn how to cast your line (and fly) straight in front of you, and it will be evident that before casting forward, you must get the line more or less extended behind you ; thus the back cast —which effects this—is the first and probably the most important thing to learn ; therefore I want you to practise this back cast before attempting to make the forward one.

I will later on describe how this forward extension of the line is generally acquired, but we will assume that you have extended—which is a simple matter—about twelve yards of your line on the grass in front of you.

PLATE XVI.

THE NORMAL FISHING POSITION.

PLATE XVII.

POSITION AT END OF BACKWARD SWITCH.
NOTICE THE LEFT HAND.

PLATE XVIII.

THE BACKWARD SWITCH OF THE TROUT ROD AS THE LINE LEAVES THE WATER.

There is one important point to remember: the right elbow should be used as the pivot of the rod, and the hand regarded as a socket, which, with the wrist rigidly controlled, makes the forearm and the butt one continuous part of the rod.

Now raise the point of the rod steadily and *vertically* upwards in order to pick up the line* and without stopping this lifting movement of the arm and rod, convert it into a smart backward switch, stopping the rod suddenly as it attains an angle of about twenty-two degrees behind the vertical (see Plate XVII.).

If the forearm be brought backward until the thumb nail is checked by the peak of the cap, and if the extended thumb be used to stop any further backward action of the rod, the wrist cannot be bent.

Plates XVII. and XVIII., and Diagrams 8 and 9, show clearly the correct position of the rod and arm at the end of and during the back overhead cast.

If the backward cast is made properly, the line will curl over the top of the rod and extend itself backward (see Plate XLI.). If the backward impetus of the rod overcomes the rigidity of the wrist, it will simply be due to the fact that "attention" is not concentrated on the duty of the thumb.

The wrist must, however, be kept rigid, and therefore attention must be so concentrated until this necessary muscular control of the rod becomes a habit. It will be of great assistance when acquiring this habit if the thumb be brought back towards the face and checked dead as it reaches the peak of the cap.

* The vertical lift upward of the point of the trout and salmon rod is made, not only to raise the line well from the water, but in order that the hand which lifts the rod may have plenty of distance to move horizontally backward in the direction in which the line is to travel in the back cast.

In order that you may grasp clearly the kind of action required for this back cast, you should imagine that there is a small piece of wet clay stuck rather insecurely on the top of your rod, and that from the first position as shown in Diagram 9, you have by a steady but increasing force to switch this piece of clay off the rod top in a *horizontal direction* behind you.

This is exactly the kind of impulse required to extend the line backward.

Remember always that it is not violence, but *vim*, which results in a correct cast.

The force employed in the back stroke should be just sufficient to extend the line after the backward action of the rod has been arrested, and, having been thus extended the line will, unless the forward cast be then made, fall to the ground behind you.*

The line should again be extended on the lawn and the whole of this practice repeated until you are satisfied that you are able to make the back cast correctly.

If you now wish to make the back cast without having your line extended on the lawn, shorten it, leaving only about twenty feet beyond the top ring of your rod. Get into the first position again, but holding the line in your left hand, the rod pointing just above the horizon (see page 159), extend your right hand and *at the same time* lift it and the point of the rod together, letting go the line, and as it falls from you in a circular outward sweep, make

* You may find your line during the back cast coming into collision with your rod, and if this bothers you, you may make a slight curve with the rod to one side or the other during the back stroke, thus keeping the rod clear of the line in its backward course. But this collision can only be due either to a faulty back stroke, or from using too long a line. If a correct motion of the back cast is made when using a medium length of line, it will lift the line above the level of the top of the rod as the line travels backward.

If the line be a long one, some of it may in its backward journey by the action of gravity travel below the top of the rod, and if brought back in the same plane may collide with it.

the back cast as before. You are now ready to make the forward cast.

The Forward Cast

At the end of this backward motion of the rod it should, being held firmly, remain stationary until the line has extended itself, and a pause is therefore necessary between

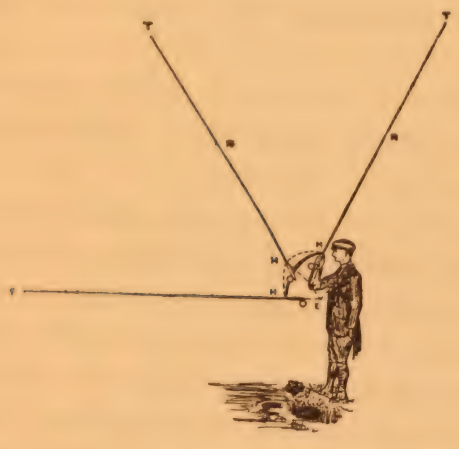


Diagram 8.

H R T and H R T—The rise and the backward movement of the trout rod.

H H H (dotted) —The two sides of the triangle through which the hand moves in making the backward cast.

H H (solid) —The third side of the triangle made by the hand in the forward cast.

the backward and forward casts in order to allow this extension of the line. It is the correct timing of this pause which is one of the secrets of a successful forward cast. This pause will vary in duration; the wind, the quality of rod, the length of line, and the force and speed of the back cast, will all influence the velocity of the backward-moving line.

Under average conditions I have determined that, with eighteen yards of line out, this pause should be about four-fifths of a second, which is about equal to the time we take in saying "and thumb"—a shorter line requiring a quicker and a longer line a more drawn out enunciation. If, then, the forward cast be made immediately after these two words have been uttered aloud, the rod being forced downward by the thumb, and the downward motion checked dead as the hand reaches the level of the elbow (see Diagram 12), a perfect forward cast of the line should be achieved.

This forward and downward motion should start from inertia and gradually increase in force until it is thus checked.

The action of the rod, when commenced, will be accelerated more rapidly in the forward than in the backward motion. In the latter, the line, being on the ground or water, cannot suffer by falling any lower, however slowly the rod may be moved in raising it, whereas unless the forward acceleration of the rod follows fairly quickly on the back stroke, the line will fall to the ground, and the forward cast will suffer in consequence. Exactly the same proportionate increase of force must, however, be applied to the backward or forward switch when once the line is in the air.

When possible the line should always be allowed to extend itself backwards before the return stroke is made, as this is the most certain method of making an accurate and delicate cast forward. In practice, although the perfect extension of the line backward at the moment the forward cast is made may not always be effected, yet the attempt will be one which enables the fisherman to extend and shoot his line further than in any other style of overhead or side casting. This style has another advantage, in that it offers less difficulty to the beginner.

At the end of the back cast the fly should have arrived at its highest point of elevation, the rod point being situated somewhere in the line between it and the place on the water where the fly has to alight.

Some fishermen, however, do not *extend* their lines behind them, and their overhead forward casts are in reality made when their line is in a vertical backward curve or loop—in other words, they make their forward casts when their lines are in a position such as is shown in Plate XLI. If the reader will turn to this Plate and assume that in the picture the fisherman is making his forward cast, he will see that this forward impulse can only be directly transmitted to the shortest portion of the line, while a good deal of the impulse must be lost in dragging the longer part of the line in the opposite direction.

While I experience no difficulty in casting in this particular style so long as a perfect continuity of force of the backward and forward action be sustained, yet I find that a successful wind cast is difficult, that my distance is more limited, and my accuracy less. In 1905, when first putting my theories into print, I had to consider, not the merits of such a style of casting, but whether a result equally good so far as delicacy was concerned would not be more easily acquired by permitting the line to extend itself backward before making the forward cast, and whether such a style would not give equal delicacy, greater accuracy, and better results when casting against the wind and for distance casting.

That I have succeeded in establishing the correctness of my theories will, I think, be generally admitted. One of my most successful pupils in flycasting, certainly as regards success at tournaments, is Mr. R. D. Hughes, and anyone who has seen him use his rod and line will have noticed how fully he permits his line to extend itself behind, before he makes his forward cast.

If the line is fully extended, every particle of impulse will be applied to it in the right direction, and consequently a better result should theoretically occur, and a greater accuracy be acquired, in that the pull will not be applied to a curve.

The forward cast, then, should be made at the expiration of the pause before mentioned; the force applied should gradually increase in strength until the rod is stopped at an angle of about twenty-two degrees above the horizontal level (see Diagram 12). This angle may be considered to be the normal one at which the downward effort of the overhead cast ceases, but it alters when making the " wind " and other variations of the overhead cast.

In order to get this forward cast correctly, it may be advisable to imagine that you are now switching *forward* a small portion of clay from the tip of your rod, and that it will be this sudden check to the rod action which causes the clay to leave the rod and fly forward.

Similarly will the line, actuated by the downward switch of the rod, unroll itself forward as the rod is checked, bringing the fly immediately over the spot on which you wish it to alight.

These instructions should be carefully considered and practised for periods of two or three minutes at a time, the whole of the exercise not lasting longer than an hour. The student should endeavour to direct the end of the line to some definite mark on the grass, on which the eye should be fixed. A friend may be asked to watch the rod, and to see that it does not incline backward beyond the angle shown in Plate XVII.

It is of the first importance that when the line is in the air it should always be under the influence of the force applied to it by the rod. The wind when against the back cast, will frequently destroy the backward energy of the

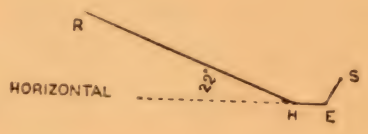
line before it has fully extended itself, the end of the line thus becoming *dead*. The same result will happen if sufficient energy be not applied to extend the line fully backward. This is a likely source of danger, as the forward switch of the rod communicates itself to the dead portion of the line with a jerk which may crack off the fly.

Diagram 12 shows the increase of force given to the rod during the forward cast.

As the student practises and acquires the correct action of casting, "shooting" the line will have to be considered and will present no difficulties; therefore, I should not advise him to let this adjunct to all perfect casting engage his attention just at first.

I can now condense this lesson into the following sentences:—

Starting from the normal position:—



1. Raise the *top* of the rod *vertically* to an angle of about sixty degrees, or if practising over water, until nearly all the line is off the surface, don't pause, but

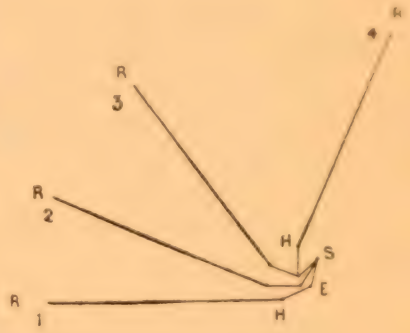
2. Switch the rod with ever increasing force *backward*, stopping it at an angle of twenty-two degrees behind the vertical line of the body.

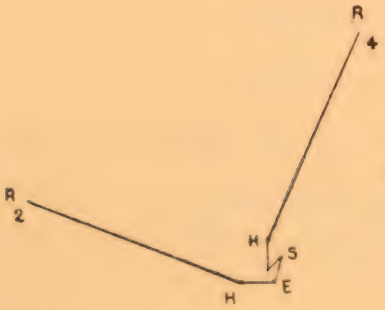
3. Keep the rod stationary at this angle until the line has extended itself behind you, and then

4. Switch the rod downward to its normal position, and as the line comes forward

5. Lower the point of the rod as far as may be advisable until the fly alights.

Condensed into words it is as follows:—Raise (to R 3), switch back (to R 4) and Pause (at R 4).





Switch down (HR 4 to R 2) and lower.

In these Diagrams—

S represents the shoulder.
H ,, ,, hand.
E ,, ,, elbow.
R ,, ,, rod.

It must be evident that the more nearly a horizontal extension of the line is obtained, the more lightly will it fall to the ground.

The Movements Required when Casting, Diagrammatically Considered

Practising on the Lawn *continued*

It will now be advisable for the student to consider the above instruction in a more detailed manner.

Starting then from the normal position, *i.e.*, with the forearm horizontal, the elbow *slightly* advanced, the angle between the upper arm and the forearm being about 115 degrees, and the rod inclined upward above the horizon at an angle of twenty-two degrees (see Diagram 10), the attention has to be kept on the tip of the forefinger, which is steadily, but with increasing force, raised vertically about *twelve* inches.

If the rod be kept in its original angle to the forearm (see Diagram 10) by an inflexibly controlled wrist, this will increase its inclination to about sixty degrees above the horizon, and will bring its top ring to about ten feet above the lawn, the line being lifted well up by this movement.

The thumb nail should now be about level with the eye, and as the elbow has been lifted a few inches and advanced still further away from the body, the arm has straightened itself somewhat, opening the angle between the forearm and the upper arm to about 140 degrees (see S E H Diagram 9).

The lifting action is not checked, but steadily accelerated into a backward cast, and is brought to an abrupt stop by the thumb as the forearm attains a vertical position (see Diagram 9).*

The wrist having been kept rigid by the attention devoted to the forefinger and the thumb, the rod, as it straightens itself, will be inclined backward—at its usual angle to the

* One of the objects of the accelerando movements of the rod in its backward and forward action respectively, is to give the greatest impulse to the line at the moment when the rod point is checked.

forearm—twenty-two degrees behind the upright (see Diagram 9).

The completed backward cast lifts the line smoothly, but with ever increasing velocity from the lawn, and draws it after the top of the rod, and, when the muscular force ceases, the rod, as it straightens itself, propels the line on its backward course.

After a pause of about one second, a forward, downward

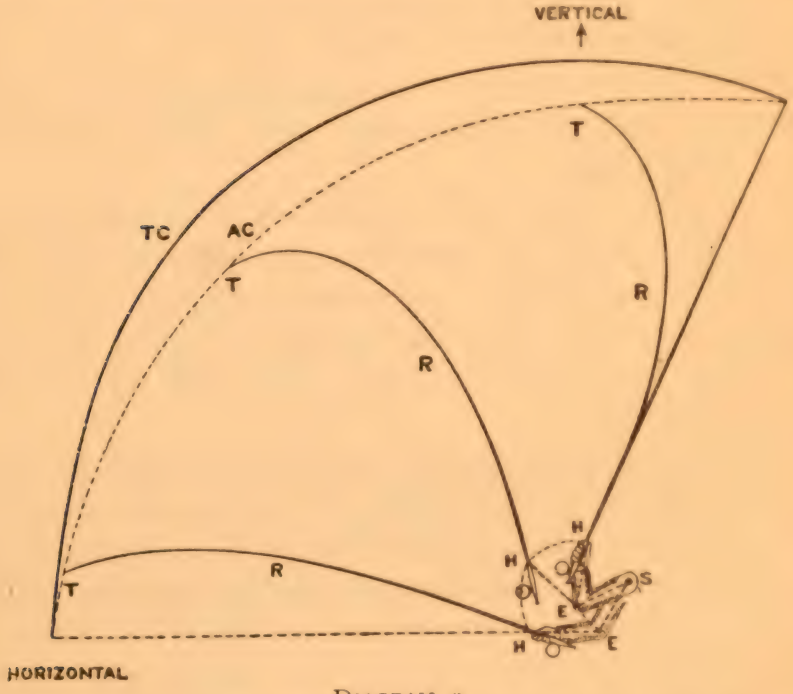


DIAGRAM 9.

Showing the curvature of the rod during the rise and the backward switch of the trout rod.

and accelerating action of the thumb point, made with a rigid wrist, forces the rod in a downward curve, this effort stopping suddenly as the forearm arrives at the horizontal position (see Diagram 12, Plate XIX.). As the rod straightens, the line extends itself horizontally, the fly being thus drawn towards its destination.

The curves shown in Diagrams 9 and 12 made by the rod point in the backward and forward casts are dissimilar.

As the forearm is raised the elbow acts as a moving pivot, and moves upward and forward, the shoulder thus becoming a second pivot until the lifting movement of the rod is converted into the backward action, at which moment the pivotal action of the shoulder ceases, and the elbow remains a stationary pivot during the rest of the backward action (see Diagram 10).

At the conclusion of the backward motion of the hand and after the thumb has checked the rod, a slight raising movement of the rod in the upward direction to which it is

DIAGRAM 10.

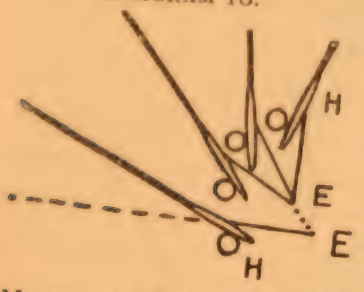
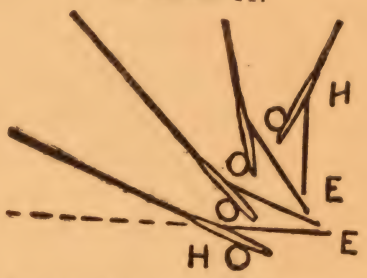


DIAGRAM 11.



Movements of the hand and elbow in the backward and forward casts.
H.—Hand.
E.—Elbow.
The reel, shown by circles, describes a spherical triangle, as shown in Diagram 13, page 176.

pointing gives a smooth effective finish to the back cast. Quite apart from this optional movement, two different curves will be made by the rod top in the back cast. In the lifting movement the rod point describes a segment of an ellipse with the shoulder and elbow as pivotal points, and in the backward movement it describes the arc of a circle with the elbow as pivot, the compound pivotal movement resulting in two curves as shown in Diagram 10.

In the forward and downward action of the rod one curve only is made by the rod point; the pivotal movements of

the shoulder and elbow, acting together in one movement, produce the elliptical curve as shown in Diagram 12.

In the forward cast it will be seen that the forearm at the end of its downward effort is in a horizontal position, but that the direction in which the rod is pointed and held in the inflexible grasp of the hand is about twenty-two degrees above the horizon, the forearm being inclined to the upper arm at an angle of about 112 degrees (see Diagram 12).

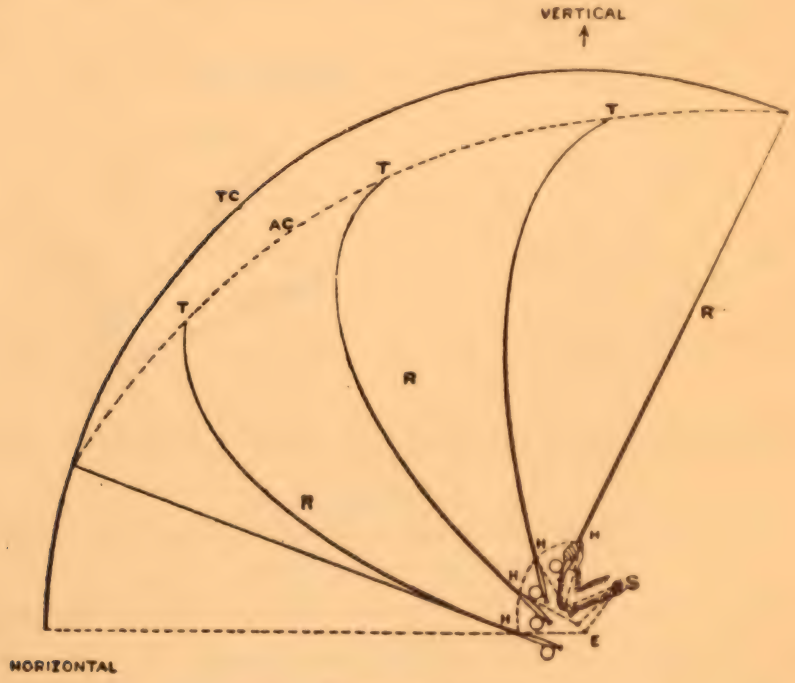


DIAGRAM 12.
Showing the curvature of the rod in the forward cast.

As the line extends itself forward the elbow is allowed to fall back to the side, thus bringing the forearm, which finished in the horizontal plane, to twenty-two degrees below it, the rod attaining a horizontal position as the line drops towards the water (see page 160).

It is at the commencement of this final lowering of the rod that the slack line should be released in "shooting." When the fly has settled on the water, the forearm can be again raised as desired to its horizontal, *i.e.*, normal, position (see page 160).

In the backward cast the power gradually applied is greater at the beginning of the upward movement, for the rod and line have to be lifted, and the latter has to be forced from the frictional contact of the water, and though the movement of the top of the rod is thus checked, the velocity of the hand is accelerated. The higher the rod is lifted the less becomes its weight on the forefinger, and the less the pull of the water, yet its velocity has to be increased in order to keep the bend in the rod and thus to give the greatest impulse to the line at the moment at which the backward effort ceases. In the forward cast the frictional resistance of the water has not to be encountered, and therefore the curve becomes more regular and wholly eccentric (see Diagram 12), the elbow making one continuous downward and backward motion (see E. Diagram 12), the pivotal movement of the upper arm at the shoulder harmonizing with this elliptical curve.

Practising over Water

The student should soon acquire the ability to extend his line easily and lightly in any desired direction. He should always remember to point his right foot and to keep his eye directed toward the spot at which he wishes his fly to alight.

When he has acquired accuracy in this important matter, he can commence his casting on any available and adjacent water. A fairly stout and well-soaked cast of gut, about six feet in length, and an artificial fly of fairly large pattern, should be attached to the end of his tapered line, the point

of the hook being broken off. For his own convenience that part of the line he is likely to use, as also the fly, should be greased either with bear or mutton fat.

He should anchor a wooden hoop in the water about fifteen yards away, and continue his practice, trying to cast the fly within the circle of the hoop, and endeavouring to do it in a light and delicate manner. When casting on water the necessity of steadily raising the rod before making the back cast will be appreciated.

When about to make the back cast the rod point should be lowered towards the water, and if there be any slack line it should be drawn in by the left hand. The rod should then be raised, gently at first, but with an ever-accelerating motion culminating in the backward switch as the fly leaves the water.

It is good practice to attain the full extension of the line by a series of backward and forward casts without permitting the line to touch or fall upon the water, the back cast being made at the moment the line has extended itself forward. It not only enables the beginner to obtain a correct action, by striving for the horizontal extension of his line, but teaches him the time which it takes for the line to extend itself backward, the forward extension being observable, and occupying the same length of time as that taken by the backward extension.

The Application of Force to the Rod, and its Results

As the rod should be imparting its greatest impulse to the line at the instant the backward or the forward action ceases, and as the hand, wrist and forearm are at this instant rigid, the latent force communicated to and partially held by the rod, as shown by its curvature, is now able—as the rod straightens itself—to communicate its pent up energy

to the line, and it is thereafter the line passes the rod point, and, unrolling on itself, pulls the fly backward or forward to its destination. (See Diagram 14).

When a correctly accelerating force is applied to the rod with an ordinary length of cast and under ordinary circumstances, the line and fly must travel backward or forward, above, or outside the radius, of the top of the rod.

Misapplied Force when Casting

If, however, at the commencement or during the backward action of the rod a snatching or jerking impulse is given, the line will overtake the rod at a lower level than its top ring and may collide with it. When a correct impulse is given, the rod point should not carry its impetus beyond the level at which its switching momentum has been checked, for the energy contained in the bend of the rod becomes exhausted by the time the rod has straightened itself.

If then, at the end of the downward stroke, the fisherman finds his rod vibrating, thrashing the water, or hitting the lawn on which he may be practising, he will know that this is entirely due to a faulty method of applying force to his rod.

This fault may be compared to that known to golfers as "snatching."

If the backward and forward efforts in casting should be from nothing, *i.e.*, a position of inertia, to maximum, or in other words be of an accelerating nature, then the reverse actions must be wrong.

To start the rod by a sudden jerking impulse leads to the following results :—

In the forward cast the line is directed upward instead of forward.

The line unrolls on itself in a large curve, and its

forward impulse is weakened by the frictional resistance of the air through which it has to travel. See Diagram 15.

The jerky impulse communicated to the line causes it to overtake the rod point before the forward and downward cast is finished, and thus releases the bend on the rod, which therefore vibrates and imparts a prejudicial undulation to the line as it extends itself. (See Plate XX.).

It fails to extend the line.

It makes it difficult to cast against the wind.

In the backward cast the line is jerked off the water, and not only are the fish scared, but the cane rod is strained and the wooden one snapped.

The rod vibrates at the end of the forward cast, and very possibly strikes the water, or the lawn, etc.

I have purposely avoided confusing the student's mind in the instructions contained in this chapter by bringing in the arguments and the reasons which lie behind the mental and physical efforts he has to make in acquiring a correct habit of projecting his fly backward and forward in the overhead cast, and while I think it quite possible that many of my readers might be able to acquire the overhead and other casts by carefully studying my directions, I feel assured that the greater number of them will appreciate a deeper insight into the laws which govern the correct method of casting.

I have yet to convince many fishermen that the methods I have originated must eventually supersede certain former ideas as to the most correct method of casting a fly, and I should consider myself unworthy of the great kindness shown and expressed by my clients if I did not make this

PLATE XIX.

THE CORRECT DOWNWARD ACTION OF THE TROUT ROD.

AND THE EXTENSION OF THE LINE.

PLATE XX.

A FAULTY DOWNWARD ACTION OF THE SALMON ROD

SHOWING THE UNDULATION OF THE LINE.

work conclusively a scientific treatise, as well as a practical aid in casting.

My theories apply not only to the single-handed rod, but also to the double-handed rod, and I have great pleasure in publishing in this work, and for the first time, the principles which must govern the true method of using the rod when spinning from the reel, which principles will be found to be capable of as accurate and as scientific a definition as that which attends the accurate casting of a trout or salmon fly, or which accompanies the art of using a straight bat.

If the habit of extending the line and fly in the overhead cast backward and forward, so that it falls with delicacy and accuracy at any desired spot, be acquired as a *knack*, and not as the result of a continued repetition of a carefully considered mental process, it will not—even if the knack be remembered—assist the fisherman to use his hand or hands in any other form of the same cast, or to make any other recognized casts.

When merely the *knack* of doing a thing is acquired by anyone, it is difficult for such an one without a considerable amount of mental analysis to explain the methods of doing it or to properly instruct others. He may say—" Watch me carefully as I do this or that, and try to do the same," and his pupil, after more or less labour, may acquire more or less knack, but it will not assist the latter to acquire any other style of casting, unless he fully analyzes the knack he has acquired, finds out exactly what his muscles are doing, and then determines the mental processes which should be applied to the muscles in order to carry out any new cast.

If he knows what he has to think of in order to get his muscles to do their work, he can, when he knows how the rod should be moved in any one style of casting, be able to vary the mental process by which his former action was

performed, and rapidly achieve success in this new method of casting a fly.*

Wrist and Arm Action

At no time when in the act of casting with a single-handed rod should the relationship between the rod, the hand, the wrist and the forearm be relaxed. Just as the metal sockets of each rod joint form the different lengths of the rod into one vibrant whole—so should the hand, with as subconscious a mental effort as that which controls the grasp of the fingers on the pen or pencil with which we are writing, make the forearm into another and final length of the rod.

To learn to do this "attention" must be maintained in the mind and concentrated on the finger and thumb of the hand when holding the rod during practice, and continued until the muscles are controlled subconsciously—that is, until a correct habit of thus holding and using the rod is formed.

The line, being always attached to the rod, is affected by its every movement, and it is necessary, therefore, that the rod should travel through definite arcs, through definite planes, and with definite velocities, having a definite pivotal action, and being actuated by definite muscles. If the thumb and fingers holding the rod are loosened, or a wrist action is enforced, the hand loses the aid of the principal muscles of the forearm, and a weakened impulse is all that can be communicated to the rod, to the line, and to the fly, by the muscles controlling the wrist. The wrist is, or should be, kept under rigid control during the whole time in which the hand is employed, either when holding the rod when the

* "Let the young angler be content with doing what he does do well; increasing his range of practice by little and slow degrees, and making sure fishing of every extra foot he gains."—*A Book on Angling*, 1885, by Francis Francis.

fly is being cast, or when the rod is extended in the act of fishing.

When I refer to the mistake of bending the wrist and to the action so frequently alluded to by fishermen as a "delicate wrist action," I mean that bending of the wrist, which permits the hand to move as a hinge to and fro in the same plane as that in which the fingers and thumb are fixed.

Now the beginner will have to decide whether he will use those muscles which are always brought into play when any determined and controlled effort is made which affects the raising, lifting, or other motion of any article held between the fingers and the thumb—or whether he will attempt to educate muscles which have neither by evolution or practice been used when thus lifting a weight.

The muscles controlling the wrist are intended, and are used, by man for the main purpose of keeping the wrist rigid, in order that the muscles of the forearm can supply their energy to the work which has to be done by the hand. The mental processes controlling our hand movements have, through the many and repeated efforts and struggles of childhood and youth, become so intimately a portion of our every action, that the thought of any movement of a finger or the thumb is sufficient to stiffen the wrist and thus permit their control by the muscles of the forearm. The muscles in the forearm are thus subconsciously controlled by the brain to this purpose, and it is only with the greatest difficulty we can acquire any other mental habit which will enable us to utilize other and less trained muscles to carry out our desires in any but our accustomed manner. Hence the difficulty of learning to cast by means of a separate muscular movement of the wrist.

The action of the rod on the line when casting a fly is of an uncoiling nature: the word "throw" as expressing

the action of casting the fly, leads to confusion in the mind of the beginner, who, associating the word "throw" with its usual application, uses the muscles of his arm in an endeavour, by a throwing action, to get his fly forward to its destination. But the idea of "throwing" the fly, *i.e.*, making a "forward" throwing action with the rod, should be banished from the mind, and the brain used in a different sequence of thought.

Unfortunately the ideas handed down to us by past authorities on the art of fly casting have resulted in our attempting to alter this universal method of using the forearm muscles in our every day action, with a result which has made effective fly casting a habit most difficult and most tedious to acquire. Such a variation of a habit effectually displaces the natural dependence we repose in the judgment of our own senses, and those who effect the backward and forward action of their rod by a mentally determined movement of the wrist lose the ability to distinguish readily and without a more or less prolonged trial, the most common and gravest fault in all single-handed rods, *viz.*, the hit.

The rod should become, so far as its action is concerned, a portion of the forearm, and its elasticity should merge into the elasticity of the holder, or otherwise there will be a point at which an abrupt change from one to another state of elasticity takes place. This more or less abrupt change does occur between each joint of the rod, but the strain of this is borne by the rigid metal sockets, and the mechanical skill of the rod maker is thus able to merge the elasticity of the top joint into that of the middle joint, and of the middle point into the butt end; and, if the rod has a good action, this elasticity should merge through the hand used as another socket—by the wrist into the forearm, and thus it is the muscles of the forearm which should do the work, and the elbow becomes the pivot of the action of the rod.

If the rod, however well its action be modulated, from the top to its handle, does not continue to modulate itself into the elasticity of the arm, there will be a *hit*, and this hit, though perhaps unobserved when the muscles which control the arm, wrist or hand are fresh and untired, soon becomes apparent when the rod is in constant use, and after a few minutes, an hour, or a few hours, as the case may be, the amount of this hit will most assuredly draw the owner's attention to the relative quality of this defect.

The dry fly rod then, whose parts are so relatively constructed as to give the best results when projecting the line and fly, and which brings the least strain on the wrist of the fisherman, will be the one in which no hit can be distinguished when casting with the elbow as pivot, with the muscles of the forearm as the force, and the wrist as an inflexible connection—making the forearm and the rod into a vibrant whole from the elbow to the top ring.

An Appreciation of the above Methods

It is with much pleasure that I insert the following letter which I received from a gentleman well-known in athletic circles, and one of the keenest sportsmen I have had the pleasure of meeting.

"*26th April*, 1913.

"Dear Mr. Shaw,—I must write you a short line of thanks for the most excellent lessons you have given me in casting. I finished them with the feeling that for the first time I really know something about the handling of a fly—and spinning rod, and that I thoroughly understand the principles on which the various casts depend. I never realized before the degree of power and accuracy which was possible with a rod, or that it could be attained so rapidly and by methods so simple. I do not think that I can describe in fewer or more laudatory words the peculiar

excellence of your system of manipulation and teaching. It seems to me that anyone of reasonable capacity, by grasping and following out your instructions, can get a 'regularity of pattern' impossible under any system less thorough; there is between yours and any other teaching that I have ever received, the whole difference between what is scientific and what is merely empirical.

"May I say further that it seems to me that to any one who can practise it, your system affords a very satisfactory test of rods and lines. Uniformity of method in casting requires uniformity of rod-action; the one must accompany the other if satisfactory results are to be obtained. Anyone who has acquired your method of casting, should therefore, be able to know by the feel of a rod whether it is a good one or not; accurate mechanical action should give an accurate mechanical test. If, as I believe, I am right in holding this view, the gain to your pupils should be a double one; not merely should they be able to cast, but also to choose themselves a suitable weapon. I do not think that there is a better proof of the scientific soundness of your method.

"Moreover, by insisting not merely upon accurate movements, but upon the principles that underlie them, you can provide your pupils with a basis upon which they can continue and extend your lessons for themselves. I wish that this science of physical motion could be applied to other branches of athletics. I am inclined to think that the results would be surprising.

"Believe me,
"With many thanks,
"Yours truly,
"F—— C——."*

Now, as we have already seen, all that is necessary in order to make an accurate cast forward is—first, an extension

* The late Major Sir Foster Cunliffe, Bart.

of the line backward in a direction away from the place at which the fly has to alight, and—secondly, an accurate extension of the line and fly forward in the plane in which the eye, the toe, and the fish are situated, and therefore the mental process and the attendant muscular exertion best suited to this desired result should first of all be comprehended, then practised and thus made into a habit.

The only perfect way to acquire any habit which is worth learning is through the mind. The mental consideration of how to perform any action leads to its perfect physical performance.

This performance is achieved, however, through a subconscious action of the brain—previously acquired—so long as the performer is sane and healthy in mind and body. In other words, there is no such thing as a reflex action of the muscles which carries out that which can be considered a habit. No purely muscular action can be regarded as a habit. The brain of man may appreciate and enable him to repeat any action and he may make such an action into a habit, but this alone is purely acquiring the habit as a knack, and so long as the brain is in touch with the muscles he can perform this knack.

But when in addition to the appreciation necessary to acquire a knack, the brain analyzes the action, comprehends the muscular movements which have to be made, and enforces on the muscles of the body a similar action, and by repetition of such thought forms a habit, it can no longer be considered as being learned as a knack.

In learning to cast the fly with a single-handed rod, the different movements required of the hand and arm are simple ones, which we have been accustomed to make many times each day of our life, and each of such movements has thus become a separate habit. It is not therefore the difficulty of making each of these movements, but of

co-ordinating them in a sequence which will result in casting a fly properly.

I have by analysis dissected the mental and physical processes which result in a perfect method of casting, and have stripped every unnecessary item from the sequence of thought which is absolutely required.

The mental process of the student should therefore follow the outline which I have thus presented to his notice, which consists of three movements of the hand—the upward, the

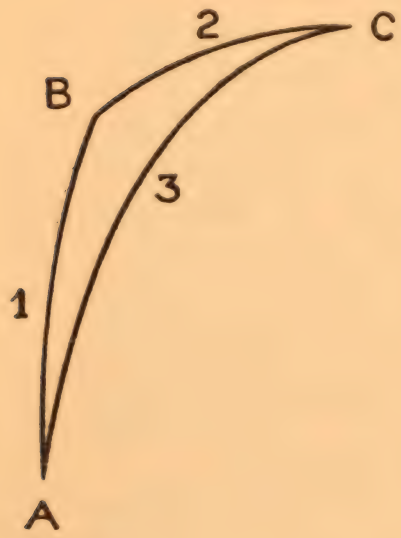


DIAGRAM 13.

Showing the three movements of the hand in making the overhead cast.

AB—Raise.
BC—Back.
CA—Down.

backward, and the downward—or to make the matter still more plain, an action of the hand which follows the perpendicular, the base and the hypothenuse of an inverted right-angled spherical triangle. This mental process should be adhered to until it is made into a habit, and the skeleton work should not be reclothed by the thoughts and ideas of the beginner when practising.

Diagram 13, illustrates not only the three movements of the hand in making the overhead or side casts with the

single handed rod, but also the movements made by the upper hand on the salmon rod when making similar casts. It will be seen that these movements form the side of an inverted right angled spherical triangle, the upward movement describing the perpendicular, the backward movement the base, and the downward movement the hypothenuse of such a triangle.

CHAPTER X

DIFFERENT METHODS AND STYLES OF CASTING

Casting a long distance—The Wind cast—Trout rod—The Wye cast—The Steeple and Galway casts—The Side cast—The Loop cast—The Loop cast for the trout rod—The Switch cast—The Spey cast or throw—The Loop cast instead of the Spey throw—Shooting the line—Force used in casting—The drag also the sag—Avoiding the drag.

THE following methods of throwing a fly will embrace every distinctive kind of cast which can be made with a single-handed trout fly-rod, and I think they will be found to overcome every difficulty met with when fly fishing.

A separate chapter is devoted to casting a fly with a two-handed rod, but there is no difference in the angles or directions through which the latter kind of rod will move, and no other than a relative difference in the force which is applied. The only difference is that two hands are used instead of one, and the main pivot of the cast is not the elbow of one arm, but a point in the rod handle, which is situated midway between the two hands when holding the rod.

The reader will, I think, understand from what has gone before, that the pivot of either the single or double-handed rod action is in reality a moving and not a stationary one (see Diagrams 163).

The action of the two-handed rod is slower and not so brilliant as the single-handed rod, and the line as a consequence is relatively slower in its backward and forward motions.

Casting a Long Distance

When endeavouring to "get out" a particularly long line, you must always remember that you can cast forward a greater length of line than you can lift off the water. The final back cast should be of such a length that you are absolutely certain of not only lifting your line off the water, but of extending it behind you in a live state—*i.e.*, so that every portion of the line should be still under the influence of its initial backward impetus when you make your final forward cast.

The secret of long-distance casting, therefore, consists in the actual knowledge of the greatest length of line which you can lift and cast backward and forward in a live state, and the ability to shoot, *i.e.*, get out the greatest amount of line in your forward cast. To be able to cast a long, and at the same time an accurate and delicate line is of inestimable use at times when dry fly fishing. The greater the distance at which you can reach your fish, the less necessity there is to crouch, crawl, etc., and it may be taken as an axiom that he who can from his skill and experience cast a long and delicate line can with equal ease, and even greater accuracy, cast his fly over any intermediate distance.

It is sometimes averred that the ability to cast a long distance is useless, because of the greater difficulty in quickly striking a fish, but those who recommend a pause between the rise and the strike should not complain on this account. There are rises of trout which can only be covered by a long cast, and for this reason alone the ability to cast a long distance should be practised. That a strike can be more quickly made, when a short line is being used, goes without question, but unless a fisherman has practised long casting he will be unable to take advantage of the chance offered when trout are rising at a greater distance from him than usual, either on a lake or river.

Lightness in picking the line off the water when making the back cast is one of the important factors to successful dry fly fishing, for more fish are scared, *i.e.*, put down, by the disturbance caused by lifting the line in a faulty back cast, than by a faulty forward one. It is therefore most important to remember that, prior to the back cast being made, the rod top should be lowered to the water and all the slack line gathered in by the left hand, and that the rod should then be raised quietly and steadily upward, but with a slightly accelerated motion, until the cast and fly are about to leave the water, when the final flicking backward motion should be given to the rod.

Lightness in the forward cast, as before mentioned, is achieved by extending the line and cast horizontally before it drops on to the water.

The Wind Cast

A head wind was, until the last few years, regarded as one of the greatest difficulties, if not really the greatest, against which the fly fisherman had to contend, but this view has now practically disappeared. In " The Science of Dry Fly Fishing," 1905, I say :—

" If the wind be against the fisherman, the downward action of the forward overhead cast should be finished still lower."

This advice is sound, and cannot be improved, remembering always that the wrist has to be kept rigid, and that the force applied culminates as the rod is checked at the conclusion of the downward effort.

If the downward action of the rod be made with a stiff wrist, and an ever-increasing force until it is checked below its normal level, the line and fly will be propelled forward at a lower level than usual, and the line will in consequence have considerably less ongoing curvature (see Diagrams 14 and 15), and the frictional resistance of the wind, which the

line has to meet, will have less chance of affecting the forward extension of the line ere the fly reaches its destination.

The fly will have been brought to a point just above its destination on the water, on which it will drop with less danger of its being blown back, than there would be if its ongoing motion ceased when it was some two or three feet above the surface.

In other words, the less the curvature of the line as it unrolls itself forward, the less will it be checked by the frictional resistance of the air.

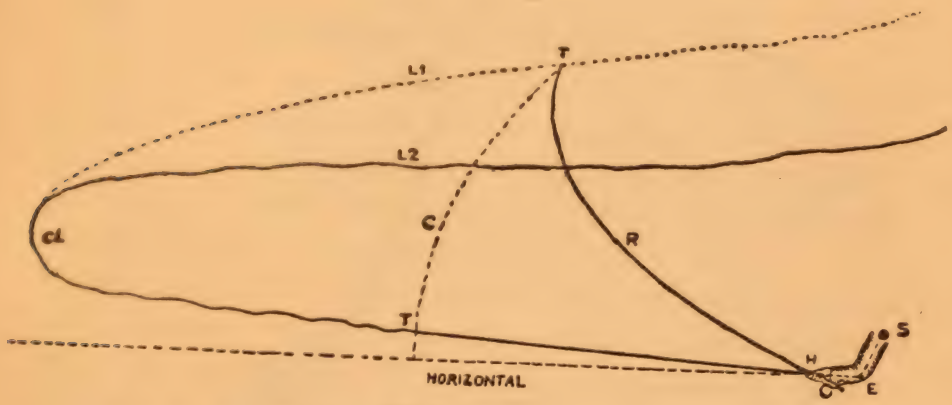


DIAGRAM 14

H R T Rod checked at this angle in downward action leads to
CL Small curvature made by advancing line.

The difference in the advancing curvature of the line in the forward cast when the rod is checked at two different points in its downward course, is shown in Diagrams 14 and 15, and the reader will at once appreciate the very much smaller surface which the line in Diagram 14 presents to the wind when the rod action is finished well down.

THE WYE CAST

We must now consider the best method of placing the fly in any spot other than that from which it has to be lifted.

When casting either with the single-handed or with the double-handed rod, in the overhead cast, unless the fly in the forward cast be returned to some place in the same plane from which it is taken, it can only be cast to some place in some new plane, and obviously this plane must be either to the right or left hand of the plane it has just left. Directly this fact is appreciated, many of the difficulties which apparently accompany the consideration of the various

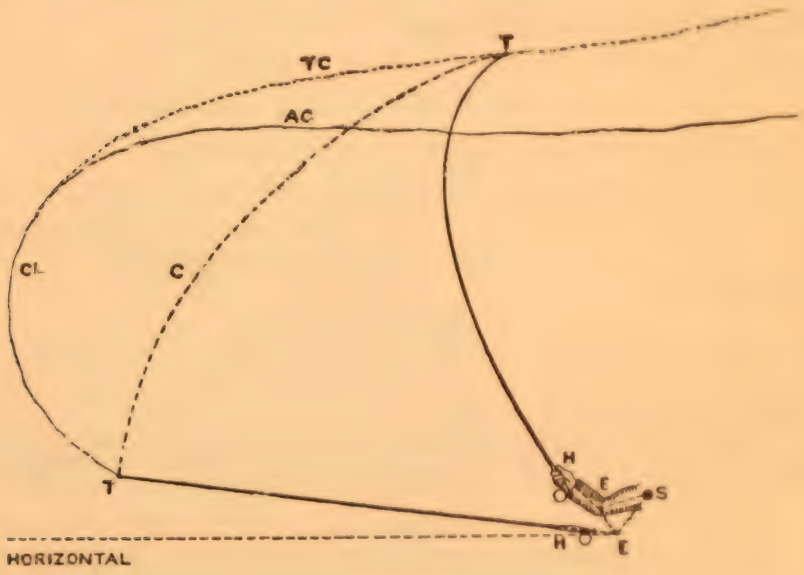


DIAGRAM 15.

HT Rod checked at this angle in downward action leads to
C L Large curvature made by advancing line.

casts which can or should be employed must vanish—for every cast made with a fly rod must be some variation of the principle which enables the fisherman to cast backward and forward in one plane, or from one plane into some other plane, *i.e.*, either from right to left, or left to right.

I introduced in the first edition of " The Science of Dry Fly Fishing," 1906, a cast I called the " Wye " cast—in the following words :—

"The line must be first extended as much as possible directly away from the spot at which the fly has to alight. To do this a curved backward side motion of the point of the rod must be made in the opposite direction, and while this is being made, the body *must* have turned so as to face toward the spot at which the fly has to alight; and on the time and the manner of this combined movement will depend the success of the cast in the new direction."

But although the success which met the introduction of the Wye cast, and which attended its use by my clients, was great, I was never thoroughly satisfied as to the scientific soundness of the method I was advocating.

I now employ a new adaptation of this "Wye" cast, which after most careful thought and trial, I consider by far the best method of casting a fly out of one plane into another, so long as the rod, line and fly can be brought back in the new plane in which it has to be cast.

The alterations of the movements of the single-handed rod when fishing up-stream are made as occasion demands, from right to left, or left to right; but when fishing down stream so long as the fisherman remains on one bank his cast should always be made across and down-stream.

It will thus be seen that in both styles of fishing the only variations possible are from right to left and from left to right.

We will assume that the reader is teaching himself to perfect this cast over grass, and that therefore he can make his movements more deliberately than he could if he were casting over water. The different positions which follow these movements can be checked by reference to the respective figures in Plate XXI. When he has learnt to make the different movements correctly, he can run these movements into one continuous action, and I should therefore

advise him in the first place to do nothing other than acquire the different movements one by one, referring to the respective figures in Plate XXI.

He should first raise his rod steadily upward in the plane into which it has been pointing, see Plate XXI., Figure 1, until it is inclined upward at an angle of about sixty degrees above the horizon. He should then turn toward the direction in which he has to cast, leaving his arm and his rod as shown in Figure 3. He should now swing his hand and rod round at the same level, keeping his rod pointed at the same angle of the horizon—into the plane in which he is now facing, until they come between his eye and the spot at which he desires the fly to alight, see Plate XXI., Figure 4. The backward and forward cast should now be made as in the overhead cast.

The hand and rod move in an S-shaped switch, when making that portion of the Wye cast between Figure 1 and the finish of the backward action, the first movement being upward, the second horizontal, and the third movement backward.

When the separate parts of this cast are thoroughly learnt, the student should, as stated above, make them in one continuous accelerating motion.

When fishing dry fly he can cast as follows:—Before raising his rod from the No. 1 position, he should turn in the first place towards the spot to which he desires to cast, then by raising the rod to the required height in the old plane and swinging it with increasing force into the new plane, he merges it into the backward part of the overhead method of casting.

Wet Fly Fishing with the Wye Cast.

When fishing wet fly, after finishing out a cast, the line and fly will be extended down-stream under his

1. SLIGHTLY RAISING THE ROD.

2. THE TOP OF THE RISE.

3. FACING INTO THE NEW PLANE.

4. THE ROD AS IT SWINGS INTO THE NEW PLANE. THE OVERHEAD CAST IS NOW MADE AS BEFORE.

THE WYE CAST WITH THE TROUT ROD.

own bank, and having decided to make the Wye cast across-stream, the fisherman glances backward to a point immediately opposite to where he wishes his fly to alight.

If there be no danger in this new plane, he should lower the point of his rod to the water and gather in by the hand as much of his line as he deems necessary—keeping the point of his rod well down when doing so. He then faces across stream toward the spot on which his fly has to alight, and, after he has turned, steadily lifts the point of the rod upwards in the plane in which it has been pointing, and then sideways with a gradually accelerated pace into the plane in which he now wishes to cast. If the movement is properly made the rod point will be elevated from sixty to seventy-five degrees above the water, and be between his eye and the direction in which he has to cast. By this time the cast is about leaving the water, the fisherman gives the final flicking impetus of this back cast away from the spot at which the fly has to alight, and finishes the cast forward and downward as before.

The student will notice that the methods of making the Wye cast when fishing up-stream or down-stream are identical, and are the same with the single-handed or the double-handed rod.

It will be seen by this method that the cast can be made from any spot either to the right or left hand with either hand uppermost, when fishing from either the right or left bank of the river. Other advantages of this variation of the Wye cast are as follows—A greater degree of accuracy is obtained and the line, if the backward cast is properly made, clears the dangers on the fisherman's banks, for it is brought out from the bank and towards the stream by this first movement of the back cast, instead of being pulled around and over these dangers, etc.

The Steeple and Galway Casts

The Steeple cast, which is sometimes used to send the line in the backward cast clear of bushes, trees, and other dangers behind the fisherman, is somewhat similar to the overhead cast. In the backward movement the effort is upward rather than backward, the force being applied in the upward part of the back cast. The rod is swung upward, instead of being lifted, and the arm is extended to its full length above, and slightly behind, the vertical line of the body. The right shoulder, the side, the hip, the leg and the foot, can also swing round with the arm as the stroke is made, the weight of the body at the end of the back stroke being supported on the flat of the right foot and the fore part of the left foot. Before casting forward, and while the line is still travelling upward and backward, the elbow should be dropped, the right foot brought forward, and the line returned in the vertical plane as in the overhead cast.

A much safer, more effective, and prettier cast, however, which I have introduced in order to surmount or avoid dangers which may lie in the direction which the backward cast is required to take, and which entirely supersedes the Steeple cast, is a variation of the Galway cast described later under Salmon Fly Casting, in chapter XVII. and illustrated in Plates XXII. and XXIII.

The Galway cast with the trout rod should be made as follows :—in the backward cast, as the line is steadily raised from the water, the body turns on the ankles to the right or left hand, until it faces the direction in which the fly has to go, and at the same time the hand holding the rod is turned or twisted round to the left or to the right respectively until the thumb is on that side of the rod from which the line is being drawn, and the reel towards the direction to which the back cast has to be made. By the

PLATE XXII.

THE BACK MOVEMENT OF THE GALWAY CAST WITH THE TROUT ROD MADE OVER THE HEAD OF THE PHOTOGRAPHER.

PLATE XXIII.

THE GALWAY CAST MADE OVER THE TOP OF AN IMAGINARY SMALL TREE.

time this movement of the body has been made, the rod should have risen to an angle of seventy-five degrees above the water. The backward cast has now to be made, and it has become a forward cast in the backward direction, and is one in which the direction of the line can be accurately gauged so as to avoid the danger of its being hung up, the idea being to send the line either upward and over the danger or to clear it to one or other side, and therefore the effort made to that end naturally affects the direction and the angle in which the rod is brought down. *Immediately* the back cast is made, the body again turns to its original position in order to cast the fly forward to its destination, the twisting movement of the hand is reversed, and, if the turning movement be not delayed, by the time the line has extended itself the rod and the body will be in the position shown in Plate XVII., and the forward cast can then be made in the ordinary way.

Two Plates are given showing the Galway cast being made over the left shoulder, Plate XXII., to clear the photographer and Plate XXIII. to clear an imaginary tree situated in a similar position. The backward action has been made, and the line is shown more or less extending itself to clear the above-mentioned dangers. The Galway cast with the double-handled rod is also illustrated. See Plates XLIII. and XLIV.).

The Side Cast

The right or left side cast is made with a precisely similar rod action to the overhead cast, and both left and right hand side casts can be made with either hand. The rod is brought back more or less horizontally to the right or left side of the body and returned in the same plane, the object being to prevent the line rising to any height in the air, and is useful when casting to or from under trees, under culverts, or up narrow, over-grown streams.

The rod is steadily raised upward and backward to an angle of about twenty-two degrees behind the vertical position of the fisherman, but inclining slightly to his right or left hand side. The line by this movement will be drawn back along the water, and a slight backward curve, as in Plate XLV., will be made to the right or left hand side, but well clear of the angler's shoulder. As the rod arrives at this position its movement is altered into an upward, forward and downward switch. The line, which has been drawn after the top of the rod in this continuous movement, will be held at the finish of the downward switch by the rod point, and will curl over it and thus extend itself over the water in the direction in which the downward switch is made.

In this Plate the fly, which has been raised from the water, is being returned to the same spot from which it was taken, but in Plates XXIV., XLVI. and XLVII. the line and fly have been raised from a position to the right or left hand of the fisherman, and are being returned—as shown in these Plates—in a new plane to a new spot. This movement is effected by first raising the rod as described above to a position about twenty-two degrees behind the shoulder, and as the motion of the rod is being continued the body and feet are turned towards the spot at which the fly has to alight, and the forward and downward action of the rod is completed as before, but is now made in the new plane, as shown on the plates above mentioned.

Like most of the curved casts it is extremely simple, and any difficulty there may be lies in the fact that the beginner will be nearly certain to make two distinct actions—a backward and a forward one—as in his straight overhead casts, forgetting that both of these are merged into a continuous motion. The backward movement of the rod should be neither a jerk nor a switch, but a very steady pulling

THE LOOP CAST FROM LEFT TO RIGHT WITH THE TROUT ROD.

action which is continued in an upward and forward, and then converted into an ever increasing downward impulse, which is checked as the hand reaches the horizontal.

The Loop Cast for the Trout Rod

Plates XXIV. and XXV. show the end of the loop cast with the single-handed rod, the danger being immediately behind the fisherman. The line has just left the water and the disturbance it has made on the surface is clearly shown to the immediate right of the fisherman in the latter plate.

In this plate the rod point has been raised in the ordinary way by a steady upward action, but instead of its being switched backward from the water, the drawing action of the hand is continued backward slightly to the right hand side of the fisherman, until the rod attains its usual angle of twenty-two degrees behind the vertical, and is slightly inclined to the right of the body. This backward movement of the hand is now converted into a slightly upward action by lifting the arm, and the cast terminates in the usual forward and downward switch of the rod. The wrist has been kept rigid, the line has curled forward after the rod point, and the disturbance to the right of the fisherman shows where it has just left the surface. Briefly, then, the action of the hand controlling the rod has been first upward and then backward, and then continued in an upward and forward circling action into the forward and downward switch. See Plate XXIV.

The Switch Cast

This cast, which is a side loop, bears the same relationship to the loop cast that the side cast does to the overhead cast.

It is made when the rod can neither be brought back vertically, or the line extended backward in the plane in

which it has already been extended forward, and in which plane it has to be returned.

The slack of the line is first gathered in as the rod is lowered to the water, and the rod point is then steadily raised in order to get the line well on the surface of the water It is then brought back horizontally by a steady side movement, through a horizontal angle of about 110 degrees. This movement is then converted into a steady upward circular movement until the rod top is as high as the overhanging obstacles will allow, and it is then brought forward in an accelerating side cast towards its destination. The height at which the forward action of the rod can be made is determined by the overhanging danger—the tree, the arch of the bridge, or culvert, etc., etc.

The first portion of this cast is obviously very simple ; the line and fly are not flicked off the water, but follow back along the surface as the rod moves backward.

The latter portion of the cast, however, owing to its more limited scope of action, requires more practice than the loop cast, before the correct forward loop of the line is created by the forward movement of the point of the rod.

The wrist must be kept stiff, although the hand, as in the side cast, has to be twisted palm up, so that the thumb precedes the rod as it is brought back sideways, and as the circular and forward switching movement begins the thumb is thus able to force the rod forward.

The Spey Cast or Throw

The Spey cast is a variation of the Loop and Switch, and has to be made when it is desired to cast the line and fly out of one plane into another, that is, to cast the fly from right to left when the rod has to be used on the left side of the body, and from left to right when the rod has to be used

on the right side of the body. The most common use which this cast is put to is in making a new cast when fishing down-stream. After a cast has been fished out, the line of the fisherman will have been worked round more or less under his own bank, and a fresh cast has now to be made in order to extend the fly more or less across the pool or portion of the river which has to be fished.

The easiest and most useful cast for this purpose is the Wye cast, as described on page 181. As directed, the fisherman looks backward and away from the new position in which he wishes his fly to fall, and if everything is clear for extending the line in the new plane, he should make the Wye cast, but if any dangers exist in this plane, he may then adopt some variation of the Spey cast. When making the Spey throw there must be a more less extension of the line in a curve up-stream, and just how much curve can be made in this extension will depend on the proximity of the dangers in the background.

Taking the danger as being close to and parallel with the bank on which the fisherman stands (see Plate XXVI.), it is obvious, first, that any great extension of the line behind him is impossible, and secondly, that the complete extension of the line up-stream will place his line in a position almost as difficult to cast from as that in which it now lies—that is, if a cast has to be made more or less across-stream (see Plate XXVI.).

But by now adopting a combination of the Loop and Switch casts, called the "Spey Throw," he is able by an up-stream motion to get, first, a certain extension only of his line up-stream, leaving the balance of the line well on the top of the water down-stream, or secondly, to lift his line from the water by a modified up-stream side cast, and deposit it on the water just above and clear of the plane in which his line has to travel across-stream.

Before making the up-stream action it is better to turn toward the direction in which the fly has to travel. The up-stream curve can then be made, and the rod movement continued in an upward and backward swing into the new plane; and the Spey throw is completed by merging this into the forward and downward switch. See Plate XXVI.

He will thus give the up-stream belly of his line enough impetus in the right direction to cause it to drag the rest of the line off the water in a loop and to bring his fly across stream in the new and desired direction.

The curve of his line by which he has effected this cast has never been extended sufficiently behind him to foul the dangers of the bank, and that portion of the line on the water never gets into danger, as it only leaves the surface as it is dragged forward by the impetus of the looping action of the rod and upper part of the line. The danger in the first method of making the up-stream action of the Spey cast is that the rod, in its downward action, may foul the line as it is being lifted up from the water in its forward motion.

In the Spey cast (Plate XXVI.), the danger is again close to and behind the fisherman. The line, which has been extended down stream, has to be propelled at an angle of about sixty degrees across the water. As stated above, the fisherman must first turn with his back to the danger, and face the direction in which he wishes to cast. He should then draw his line up-stream sideways to his right, and by then raising his rod point upwards, and backwards in a circling action, convert this into the forward and downward action of the rod.*

By switching down with the correct action, the line, at the conclusion of the downward action of the hand—urged forward by the gradually increasing force of the downward

* The Plates and Diagrams under the head of the Salmon Rod will illustrate these casts when made by the trout rod.

PLATE XXV.

THE END OF THE LOOP CAST WITH THE TROUT ROD.

NOTICE THE DISTURBANCE OF THE WATER AS THE LINE UNROLLS FORWARD.

PLATE XXVI.

THE END OF SPEY THROW WITH THE TROUT ROD.

NOTICE THE DISTURBANCE TO THE LEFT AS THE LINE LEAVES THE WATER.

switch and the after-straightening of the rod itself—shoots forward in the desired direction, and gradually unrolling on itself, finally brings the fly to the required spot.

The end of the line, in the Loop, the Switch and the Spey casts, is held by the water, and thus prevented from fouling the danger behind the fisherman, the downward movement of the rod being followed by the unrolling action of the line as it leaves the water and is propelled forward.

In Plate XXVI. the disturbance caused by the end of the line leaving the water is shown in the left foreground of the picture. The difficulty of this cast consists in avoiding the fouling of the line by the rod in its downward action. With an ordinary length of the line it means either making the action of the rod more or less of a switching character, and making the downward cut of the rod with a slanting down-stream action, instead of a directly vertical downward action in the desired plane, or by drawing or lifting the line and letting it fall sufficiently backward, *i.e.*, clear—to the right of the fisherman, the downward forward action of the rod not being made directly over the line cannot, therefore, foul it (see Plate XLIX., Salmon).

The former is the easier and the more scientific method—the latter by far the most difficult to acquire. If both are done well, there is but little to choose in the ultimate results of either method.

The various attempts to explain how this useful cast is made, appear to me to be varied only by the individual methods of each fisherman, who has had to work out his own method of making his "Spey throw."

The Loop Cast instead of the Spey Throw

When wading and when danger is close behind, the Spey cast as just described can be very conveniently discarded for the Loop cast (see p. 329). The Loop cast has

this advantage, that it can be made without any danger of fouling the line. (See Plates XLVI. and XLVII).

If one desires to make the cast toward the right hand, the rod can be brought back to the left hand side of the body, the fisherman turning towards the right and making his downward switch to the right—clear of the line in the water—and towards the spot where he desires his fly to fall (see Plate XLVII.).

If it be desired to make the fresh cast to the left, he will bring his rod back to the right as in the Loop cast, turning to the left and making his new cast also away from his line which lies on the water. In this method therefore no danger is encountered of fouling the line (See Plate XLVI.).

The fisherman who stands on a bank cannot as a rule bring his line back on his down-stream side—or it would probably foul the bank—and consequently he frequently finds it difficult to make the loop across-stream. If he tries to make the loop across-stream by bringing his rod back on his up-stream side, he must bring his rod down directly across his line, with a greater danger of a foul, and hence the necessity for making the Spey throw.

If the wind is blowing from behind and hindering the backward extension of the line, the Loop or the Switch cast can be used with excellent effect.

Shooting the Line Force used in Casting

The muscular effort required in lifting the line from the water and casting a trout or salmon fly depends on the length of the line which has to be extended, but the power used while learning is generally greatly in excess of that which is required. Beginners should remember that it is the method, or manner, of applying this force, more than its amount, which is important. It is vim, and not violence,

which should be used. But as the exact force which is required in an absolutely perfect method of extending each cast is only attained after much experience, a slight excess of the actual force needed to extend the line is advisable. When making the forward cast this excess must be only sufficient to enable the line to *extend* itself horizontally, and to give it, in its forward progress, enough impetus to draw through the rings of the rod some, if not all, of the slack line which has been recovered prior to the back cast, and which is being held by the hand of the fisherman. The method of thus extending the length of each cast is called "shooting" the line.

At the conclusion of the downward effort the rod has still to straighten itself, and until it has done so the forward pull on the line *continues* to be accelerated, and the line must not be liberated in "shooting" until the rod has imparted this latent energy to the line. Unless the line be allowed to shoot, at the conclusion of the downward effort, the limit of its extension will probably be reached before its forward impetus has been exhausted, and the accuracy of the cast will suffer because the fly—as the line straightens itself—will be jerked more or less backward towards the fisherman, and will fall either on the line, or in some manner calculated to frighten the fish.

"Shooting the line" should be the method used when the line is being lengthened, prior to the final cast, the line being drawn off the reel by the left hand, and held until the conclusion of each downward action of the forearm, when as the rod straightens, it is liberated and allowed to "shoot."

The Drag, also the Sag

To avoid these faults constitutes one of the greatest difficulties in fishing. The drag, though it may be sometimes due to a fault on the part of the fisherman, is generally

due to circumstances over which he appears to have little or no control.

The drag is a bugbear to both the single-handed and the double-handed fisherman, whether he be casting a wet or a dry trout fly, a salmon fly, or spinning. The fault is always due to the fact that some part of the line between the rod-top and the lure travels faster than the lure itself, and consequently either drags the dry fly along the water, or produces a sag in the line, during the down-stream methods of casting, which very naturally prevents the realization of the fact that a fish is investigating the sunken lure.

The first kind of drag, and one which is most common and the least recognized by the fisherman himself, is that which occurs immediately his dry fly falls on the water, and this particular fault is due to the fact that the line is not dead when it falls, but has a distinct motion of its own sometimes toward and sometimes away from the fisherman, which affects the fly after it has fallen, dragging it with an unnatural motion along the surface. The fault—save when a strong wind affects the line and gives it motion—is that if the cast has been correctly made, the shooting of the line has not been properly effected, and the line in such a cast has been allowed to extend itself with a jerk and recoil back towards the fisherman. A second kind of drag will occur even if the casting and the shooting have been properly carried out, if the rod be not lowered to the water in exact sympathy with the falling line.

In this case if the fisherman is supposed to be casting from the bank some four feet above the water level, and if the rod has been checked in its downward course at the usual angle, the line, by the time it is extended, would be at a height of about six feet above the water. Owing to the fact that it has been correctly released, it has exhausted all its surplus energy in dragging out the spare line, has

become quite dead, and is falling to the water. If the rod is not lowered and extended a little forward, the rod point will become the centre of a circle of which the line is the radius, and the line at its heaviest end being held at this point, cannot fall vertically, but is drawn backward in a curve towards the fisherman, and by this backward curving action it draws the fly after it, and produces the drag.

This error grows greater the higher the fisherman be situated above the water ; when casting from a high bridge, for instance, it is almost impossible to avoid this sort of drag.

A common form of drag can also occur even when the line has correctly fallen on the water.

If a fish be rising in an eddy on the far side of the stream, and the fly be thrown directly across the rapid water into the still water—the middle portion of the line will alight on the more rapid part of the current and will travel down stream faster than the cast and fly ; this will most certainly create the drag.

Avoiding the Drag

Under such circumstances, to place a dry fly which will remain on the water sufficiently long to give the fish an opportunity of rising, is, perhaps one of the most difficult casts which have to be made.

If the following variation of the side cast be made up-stream, the immediate drag can be avoided.

The reader may remember that in my instructions in the downward action of the rod, I say that the rod should be brought forward with accelerating force ; starting the movement gently and without a jerk, etc. A jerky start may not only fail to extend the line, but will certainly bring the belly of the line downward towards or on the water before the line has extended itself.

Starting either motion of the rod in casting with a sudden

jerking impulse is a very common fault, and it was while studying this fault and its result in casting that I discovered the most certain method of throwing a fly so as to avoid the drag caused by a rapid stream running between the fisherman and the position of a rising trout.

When a trout is seen rising in a position that must insure a drag if the overhead cast be adopted, a more or less side cast should be made up-stream (see Side cast). If the forward side cast be started gently and with an accelerating forward action, and a jerky forward impulse given to the rod after it starts, and the rest of the forward action be continued as before, this snatchy action will cause the line to belly up-stream, just as the same snatchy action will cause the line to belly down toward the water in the overhead cast.

This up-stream curve in the line as it falls on the water should not affect the direction of the fly, but it will permit it to fall correctly and remain undisturbed on the water until the more rapid run of the stream has swept the curved portion of the line from its up-stream side to a similar curve down-stream—by which time, the trout should have risen, if it means to take the fly.

This method of avoiding such a drag on the dry fly will also assist the fisherman when he has to encounter a similar evil when fishing down-stream, which occasions what is known as a sagging line, *i.e.*, the belly of the line moving faster down-stream than the fly end of the line.

It will be seen that by adopting this method of casting, the line can always be thrown in a curve on the water. This curvature of the line on the water is at times useful when the fisherman is immediately below his fish, for a straight line which brings a dry fly immediately above a fish may disturb the water, whereas if the fly be thrown immediately above the fish, as it should be, with such a curving action of the line, there will be considerable less danger of the fish being scared.

CHAPTER XI

MENTAL CONTROL OF THE MUSCLES WHEN LEARNING TO CAST

The Forefinger—The Influence of the thumb in the forward cast—Mental effort—Conscious effort—New muscular movement—Misplaced attention—The meaning of a stiff wrist—Misapplied energy—Attention—A quotation—Mr. G. C. Marryat—The importance of the muscles of the forearm.

The Forefinger

The necessary muscular energy affecting the upward, backward and downward movement of the Trout Rod should be effected by the muscles of the arm, and communicated through a rigid wrist to the hand holding the rod, the influences of the hand being predominated by the "attention" given to the grip of the rod by the forefinger and thumb. Just as in a musical chord one note should be dominant, so in the hand grasp on the rod the dominant influence should be that of the forefinger in the back cast and the thumb in the forward cast.

When the backward cast has to be made, and when the line is extended in the act of fishing, the rod is first lowered towards the water, and the slack line gathered in by the left hand. The rod is then lifted by a steady and rapidly increasing upward effort of the forefinger. As this upward movement continues, the frictional resistance of the water on the line begins to diminish, and the lifting force of the forefinger gradually resolves itself into a backward action, increased to its conclusion by a quickening backward effort, the rod being abruptly checked, when it reaches an angle

of twenty-two degrees behind the vertical, by the thumb, which, with the forearm, is now pointing vertically upward.

The Influence of the Thumb in the Forward Cast

The rod should be dominated by the thumb from now to the conclusion of the forward cast (see Plate XVII). After a pause to allow the line to extend itself backward, the forward and downward action of the rod should be commenced by a steadily increasing forward and downward curving pressure of the point of the thumb.

The pressure or push forward of the thumb produces a forward bend in the rod, which acquires an answering forward and downward velocity, until it is stopped dead at an angle of twenty-two degrees above the horizon ; the action of the hand in checking it here should be again dominated by the forefinger.

Now, however light may be the pressure on the rod of either the finger or the thumb in these duties, yet an absolutely controlled rigidity of the wrist will follow, and it cannot displace the elbow as a pivotal hinge.

Mental Effort

If " attention "* be given to the respective pressures of the rod by the forefinger and the thumb, the elastic continuity of the rod and forearm is maintained and the pivotal action of the elbow is enforced.

Fortunately the mental effort of using the forefinger and thumb, which is necessary to effect the correct hold of the rod, has, in other actions, become such an habitual process in our daily life that we can apply it when casting a fly.

We have only to think of one of the many thumb or

* By " attention," as I have explained elsewhere, I do not mean attention to a thought or action which is habitual, but attention to mental effort which is original, such as that which is required to keep the thumb at a constant angle to the forearm during the effort of casting.

forefinger actions we make, in order to find that the turning of the hand, the wrist and the forearm into one controlled lever is at once subconsciously effected. The conscious holding of the pencil between the forefinger and thumb—nay, the conscious holding of a blade of grass by them—will keep the wrist under rigid control so long as attention to this action is maintained.

Conscious Effort

I use the word "consciously" with a definite and precise meaning, and I do not mean "consciously" thinking of writing, but "consciously" thinking of how to do it while doing it—the writing. We have made the muscular control of the pencil into a habit, and we can now, therefore, make other muscular movements at the same time, but no two *original* muscular movements can each be successfully thought out and successfully carried into effect at the same moment of time. When writing, etc., as when using the rod, a secondary and considered action of the wrist is not required*—attention must not be devoted to the wrist, but to the thumb and forefinger.

The habit of writing has been acquired during the long forgotten, but nevertheless wearying hours of attention during our youth. The mental habit of thinking in the finger and the thumb alternately is not taught to children; they have to acquire it, and the complicated muscular movements which have grown into the harmoniously continued action called writing, are, as a rule, the result of an acquired knack. Try to write with the left hand for the first time, and you will begin to appreciate the mental processes which are involved in that which has become one of the most common of our habitual activities of the right hand.

* Although such a wrist action can be easily made, when writing or casting has become a habit, by a secondary mentally controlled effort.

New Muscular Movement

In order quickly and correctly to perform any *new* muscular movement, the effort should be controlled by a carefully directed mental effort, and it will be found as the muscles continue to answer to a repetition of the mental effort, that gradually a correct habit is formed, and the student, however right or left handed he may be, by *thus* making such a habit with one hand, has acquired the ability to use his other hand with equal success in the accomplishment of this action.

It is thus that having taught my clients how to cast the fly successfully with one hand, they find to their intense surprise that they have also acquired the ability to use the other hand in a similar cast and with a success equal in a relative degree of course to the muscular development of each set of muscles of the forearm.

It is the want of analytical thought on the part of the instructor which prevents his readily imparting the mental methods by which he sub-consciously, or through habit alone, accomplishes his master actions. He may have a set of rules by which he instructs, but he rarely enforces on his pupils the necessity of making those mental efforts and thought processes by which alone each new muscular movement should be controlled. Such an one may say—"You should do this," or that—in this way, or that way, etc., but he rarely tells his pupil to *think* out one by one each of the muscular movements before making them, and then to do each one correctly and with forethought, before trying to combine them into one effort.

The Grasp on the Rod

The hand holding the single-handed rod should be actuated by the principal muscles of the forearm, but without a rigidly controlled wrist these muscles cannot

communicate the full amount of their energy to the hand.

In everything we do, with the thumb or forefinger or with both, at the moment of doing it we subconsciously also control the wrist. But writers on the subject of fly-casting have insisted on wrist action—a "delicate wrist action" being, according to them, the necessary adjunct to casting with a single-handed rod. By thus directing the attention of the learner to the wrist, and not to the forearm and thumb, they have not assisted those who have depended on their advice, and have actually sinned against the methods they themselves employ in nine cases out of ten when they are successfully casting a fly. So far as this advice is concerned, the mistake is generally due to a faulty analysis of the habits on which they depend. The movement of the wrist, if made at all, is purely a secondary and unnecessary action depending on a separate and mentally controlled muscular activity, and if the wrist is used as a hinge, it is moved as the result of thought applied with this definite object in view.

Misplaced Attention

The author, when teaching a lady to cast a trout fly, endeavoured to get her to raise her hand upward and toward her face without bending her wrist (a stiff wrist being necessary for the successful accomplishment of the cast). When casting she had been always accustomed to bend her wrist, and when endeavouring to follow the author's instructions, she was absolutely unable to raise her hand from the horizontal position to her face. The action should have been performed from the elbow, but, taking her mind from her wrist, she concentrated it on her shoulder, and thus failed. The author then said: "Oh, never mind—if you cannot do it, we will find some other way to make you do

so; but, before proceeding, may I draw your attention to the fact that you have a smut on your nose?" Whereupon the lady's hand immediately went up to her nose, much to her astonishment. She made this quite natural action subconsciously; her thoughts being taken off her shoulder, subconscious activity instantly lifted the arm from the elbow in its usual way. In endeavouring to keep her wrist stiff, she had unconsciously included the muscles of the arm as being inhibited, and endeavoured to raise her hand with the wrong muscles—the muscles of the shoulder.

The Meaning of a Stiff Wrist

To tell the student therefore that a cast depends on a "delicate wrist action" is to focus his attention on his wrist and land him in a mental muddle. The thought should for choice be focussed in the ball of the thumb or forefinger.

If we hit at, or even reach out and firmly touch, a definite object in front of the body, the hand has become an inflexible socket, stiffening the wrist in every direction, and permitting the muscles of the forearm to supply the force necessary to, and controlling the blow, or the action of touching.

I hope my reader will not confuse my meaning. The wrist, before and leading up to the hit by the stick, the racket, the golf club, the cricket bat, the touch by the bow of the violin, etc., may, if so desired, be bent at will, yet at the moment the attention is consciously applied to striking the object, playing the chord, etc., the wrist will be so controlled that unless it be desired, it will not be bent. Now in the case of the fishing rod, this control is absolutely necessary all the time the rod is being used for the purpose of casting, if it be desired to project the fly most accurately and effectively, because, there is a wide difference between the action of striking an object with a stick, hitting a tennis ball, etc., and casting a trout fly.

In the one the object—the *blow*—is achieved at a special fraction of time, and the velocity of the weapon increases to this climax in order to effectually impart its force to the object struck, and *so long as this force is correctly imparted* it matters not what individual flourishes or evolutions have preceded the impact; but the reverse is the case with a rod and line—the line is always attached to the rod and for so long as this is so all movements of the rod must affect it.

This fact may be illustrated, for instance, by the difference in the action between a fishing rod and a woomera, or throwing stick of the aboriginals of North Queensland; for while the spear, so long as it rests in the woomera, requires a definite and continued impulse until it is discharged, yet the spear's onward course is thereafter disassociated with the woomera, which can be dropped to the earth without affecting the flight of the spear. Not so the line, which is not disassociated with the fishing rod after the casting effort is made—its forward course being very seriously affected by every after movement of the rod, *i.e.*, until the fly reaches the water and the line comes to rest, until which time a rigid control of the rod has to be maintained.

The line to which the fly is attached cannot be thrown, and it has been the mistake of the past to try and throw it. It is, or should be, by a continuous motion of the rod, unrolled.

Misapplied Energy

I notice that in a recent book on the art of fly-fishing, the author emphasizes the necessity of "keeping the hand tightly grasping the rod," but at the same time condemns the use of what he terms a "stiff wrist." This serves to show the extreme confusion of thought which characterizes those who, though they may be able to extend a fly to their own satisfaction, are yet unable to appreciate the muscular control

of the wrist which must follow if they consciously apply themselves to this advice.

It is, besides this point, quite unnecessary to advise the beginner to grasp the handle of his rod as *tightly as possible*, if he wishes to cast a fly with accuracy and delicacy. The rod should be no more tightly grasped than is the pen with which a person writes. The hand should act as the socket joints, which make one vibrant whole of a two or three piece rod, and a moment's reflection will prove that beyond these sockets forming a close fitting union between the different parts of a rod, the female portion of the sockets do not exercise the slightest grasping pressure on the joint they enclose.

The reason that people offer this advice is because they confuse the principles governing the control of the rod, and possibly because they have been, or are, learning to alter the faulty dependence on a separate wrist control of the rod into a forearm and hand control, and think that it is only by an excess of mental concentration on the grasp of the rod that they can conquer the older and faulty habit of bending the wrist. But none the less, the beginner should have no misconceptions on this important subject.

In the second edition of a former work (1907), page 8, I say: "If the thumb be pressed firmly against the rod, the wrist cannot be bent, and the rod cannot go back beyond this angle," again I say, on page 219, "this grasp will of necessity produce a rigid wrist, and should therefore assist the sudden check which is so important," but it will be seen that this advice was given to my readers with the object of making them keep the wrist rigid.

Attention

Prior to 1907 I had not discovered that all that it was necessary to do in order to keep the wrist under control was

to confine the attention to the definite object of doing something with the forefinger or thumb, and that therefore if attention were concentrated on the pressure by the ball of the thumb, wrist action would be avoided. I knew then, however, that the mental activity—which a consciously enforced grasp of the rod entails—would prevent the wrist action from occurring, and hence my advice, the value of which—but not the actual result which attends it—is recognised by the author of the book previously mentioned.

It is not, however, necessary to force the mind to make any increase in effort, in order to attain that controlled rigidity of the wrist, which is necessary when effecting ninety-nine out of every hundred of the daily actions made by the hand. This author is, however, by this advice, unwittingly helping his readers, for he is preventing or neutralizing the faulty consequences of the other advice he offers, the necessity of a pivotal wrist action; for if "attention" be maintained in order to grasp the rod by the finger and thumb, however light may be the grasp, this enforces a constant angle between the forearm and the rod, and prevents a wrist action, and by so doing allows the most important muscles of the forearm to control the movement of the rod, a consummation devoutly to be desired, but which is defeated if a pivotal action of the wrist be effected.

The beginner should remember that the muscles he should employ in the different movements required in casting are those which he has through habit been using from his infancy in a variety of other and distinct actions, and although the object he has in view when using them may be a new one, yet concentration of thought will soon link them into a well-ordered sequence.

The movements made by the hand in casting are three—the raise, the back action and the forward action—but each of these movements has in other of our every-day actions

already become a separate habit; the difficulty then is having to make a sequence of these three into the one habit of casting.

Should any cramped or stiff feeling be experienced in the fingers or muscles of the arm, etc., when practising, it will, if the mental process be a correct one, be due to an over-application of force by those muscles in grasping the rod. A child will over-exert the muscles of his thumb and fingers by grasping too tightly the pen or pencil when *learning* to write, and thus experience the same sort of cramp in his forefingers or thumb.

It is because of that most erroneous of all instructions, *viz.*, that which draws the attention of the beginner to the wrist, when he is told to "carry out a delicate wrist action" —that work is required from a system of muscles intended, developed and trained for the one purpose of preventing the wrist being thus turned into a pivot, and consequently the fatigue and stiffness of the muscles so frequently mentioned are experienced.

Attention should be concentrated on keeping the forefinger and the thumb to their respective work on the handle of the rod, until such concentration becomes unnecessary owing to the fact that "attention" has been replaced by a subconscious habitual action.

A Quotation

Mr. Halford, in his latest book, continues to advocate a pivotal wrist action in the backward and forward cast, and he says: "I venture to suggest the best of performers do practically all the work with the wrist," and later on he says: "Some few fishermen cast with an almost stiff wrist, and use the forearm as the motive power. It is not a pretty style, but there are undoubtedly many first-rate fishermen who invariably adopt this method."

I trust that I am not unduly optimistic in believing that I am generally considered as being the pioneer of the stiff wrist theory; certainly I have always recommended the forearm muscles as the power to be employed in *all* and *every* sort of single-handed casting with a fly rod.

Mr. G. C. Marryat

Mr. G. C. Marryat—than whom no better fisherman ever lived—not only used the thumb as the agent for controlling the inflexibility of the wrist and permitting the muscles of the forearm to do the work, but used his forefinger to assist the thumb in doing so. I believe this was due to the fact that the rods used in those days were not so light or so well actioned as those of the present day, and I have heard that those used by Mr. G. C. Marryat were by no means the lightest even of those then built. Consequently the aid of the forefinger to assist the thumb in its duty of controlling the inflexibility of the wrist, is understandable, and was apparently used by Mr. G. C. Marryat in order that the muscles of the forearm should effectively convey the force necessary in delivering his fly.

Many men are strong enough to get out a fairly lengthy line, and very often an accurate one, when obviously bringing into play a good deal of pivotal wrist action, but a closer analysis of their casting will show that even this is only a limited wrist action which occurs at a portion of the cast least vital to its ultimate success; this pivotal action, however is more or less corrected by its being converted into a forearm action at the most critical and important portion of the cast, *i.e.*, as the downward action of the rod is checked —and this by the rigidity of the wrist at that moment.

At the conclusion of the backward and forward effort it may be found by those who make the wrist one of the pivots of the rod action, that their casting is improved by what they

term a wrist action, and by which wrist action many of my clients have told me that they think they give a final flick to the rod. If, however, they very closely consider this action, they will find out that this flick is in reality produced by a deliberately executed thumb and finger action which stiffens the wrist and permits the muscles of the forearm to communicate in the final effort this impulse to the fishing rod. In other words they permit the muscles of the forearm to do the work for which they were intended, and, late as this control is on the rod, it yet materially improves their casting.

The Importance of the Muscles of the Forearm

It is on the muscles of the forearm and the use of the elbow as pivot that the fisherman must rely, and if anyone doubt this, let his forearm be held rigidly by a friend in any position, and let him see of how little use his hand and wrist action are when making his backward and forward cast, when deprived of the use of the forearm muscles. If, on the other hand, he will fasten the butt end of his rod to his forearm above the wrist, by a handkerchief, and then use the forearm and its muscles to cast with, the elbow being the pivot on which the movement is made, he will appreciate the fact that this produces a controlled wrist action and enables him to cast with the greatest ease and accuracy.

When a habit is acquired of thus using the forearm in the manner I advise, this independent pivotal wrist action——which has been so persistently recommended, and which has proved a bugbear to so many learners—will be found to be absolutely unnecessary and prejudicial to the best method of casting a fly, and he will then, as an after result, find that any secondary wrist action cannot without definite "attention," and without definite determination, be made. If, however, such a wrist action be definitely

enforced by the brain, it will be found that the splendid energy of the muscles of the forearm are replaced by the energy of the less effective ones which control the action of the wrist, and both the accuracy and limit of the cast will be affected.

All the clients I have coached in Trout Fly Casting have been taught to use the single-handed rod with the muscles of the forearm as the power, the wrist being the inflexible connection between the hand and the forearm, and with the elbow as a pivot ; and if the delight expressed in hundreds of unsolicited testimonials can be accepted as evidence, or success in tournament casting can be regarded as an index of the correct method of using the muscles in the act of casting, then I think it must be evident that my method of casting is the correct one.

With regard to the attention which is so necessary in order to acquire perfection, it is well to remember the words of Shakespeare :

" There is nothing either good or bad but thinking makes it so."—*Hamlet*, Act II., Scene 2.

CHAPTER XII

THE ACTION AND QUALITIES OF A PERFECT TROUT ROD

Baden-Powell and testing rods—A mechanical test—The hand test—A correct method of testing—The action—The consideration of a stiff and of a whippy action in a fly rod—The perfect rod—The treatment of a fly rod—Tournament rods—Points to remember when selecting a rod—The virtues or otherwise of a dry fly rod.

It will be generally admitted that as regards the construction of the weapons and appliances used in the various fields of sport, none can excel, and very few equal, in science and delicacy of their make, the modern split cane fly rod, the tapered line and casts, the reels, artificial flies, etc., etc., which are now used in fly fishing.

It is necessary, however, to consider most carefully, not only the qualities which constitute a perfect fly rod, but the difficulties which beset the judicious selection of one.

Baden Powell and Testing Rods

A method of testing some of the qualities of a fly rod was introduced and advocated some years ago by, I think, Mr. W. Baden-Powell, K.C. These theories were exhaustively examined and discussed in the sporting press, etc. The originator of this method of testing a rod suggested that the butt end of the rod should be securely fixed in some mechanical holder, the rod being inclined to the horizontal at various angles, and that a definitely considered weight should be suspended from its top ring, the idea being that the curvature of the rod, the exact distance extended horizontally by this plummet on a base line, and its rate of

vibrations should be compared with the curvature, vibrations, etc., of some rod, whose length, weight, curvature and vibratory action was standardized, this test affording some indication of the relative qualities of the rod tested.

I think that the strength and the vibration of the finished rod can be thus standardized, and that the method of a base line as suggested by Mr. Baden-Powell, in conjunction with a consideration of the curves made by the rod when subjected to pressure, is effective, simple, and ingenious.

It will be recognized, however, that such a test could afford no indication of that most important quality, the " action " of the rod on the holder in which it was fixed, and therefore the information derived from such a method would be of little use to a fisherman when selecting a rod, for his hand would have to take the place of a holder used in such a test.

By the action of a rod is hardly meant its amount of whippiness, its balance, its rate of vibrations, its power, etc., but rather a something which affects the hand, wrist, and forearm of the holder, and which is the direct result of these combined qualities.

A Mechanical Test

When handling a rod we speak of its having a delightful, or the reverse, action, and we judge of this by its influence on the hand which holds it. The term " action " therefore is, or at least should be, used as a separate term to be applied to the feel of the rod, which is a result of the combined influences of its other qualities.

Now the mechanical test introduced by Mr. W. Baden-Powell, gives no clue to this influence, *i.e.*, the action of the rod on the vice or holder in which it is fixed. The rod then which produces the least hit or jar on whatever may be the holder in which it is placed, is that rod which will be the

most pleasant to use, and, provided its other qualities be equally good, will permit of the greatest accuracy and delicacy in casting.

A test made in any such mechanical manner, cannot be of any service in answering the question as to what effect the action of a rod has on the wrist and arm of the fisherman. It is the senses of the fisherman alone which must be his guide as to this action, and if he be inexperienced, and the particular sense required to test the action of the rod on his wrist has not been educated, he will, if he makes his selection in a shop, most likely err in the choice of a rod.

The Hand Test

If we take the top end of a three piece rod, and, holding it inflexibly in one hand, we try its action by striking or switching it backward and forward, we shall most likely say what a beautiful, quick action, etc., it has. If we then take the middle joint of the same rod, and do likewise, we shall say that its action is awkward and stiff, and if we take the butt end we shall still more emphatically condemn its action, etc. Now, fixing the two upper joints together we shall find that the stiff action of the middle joint has to some extent been modified, and when we fix the three joints together we may perchance say—What a perfect action! But it must be at once evident that as the forearm constitutes another joint, the rod is, when thus tested, a four-joint rod, and its perfection really depends upon the relationship of the upper three pieces to the fourth piece—the forearm.

A rod, when tested in a mechanical holder, may have a rate and degree of vibrations approaching that of the most perfect rod, and yet when tested by those members which have to control and actuate it, viz., the hand, the wrist, and the forearm, may be intolerably severe on the wrist.

A Correct Method of Testing

It is evident then that a test should be made by the hand, but equally also that it must be made in some well-considered and definite manner. Obviously a very varied effect will be produced on the senses by the same rod if the wrist be used, in one case, as a well controlled extension of the forearm, and in the other simply as a more or less controlled hinge between the forearm and the hand. If a more or less rigid and weighty stick be used as in the backward or forward motion of the fishing rod, its backward action being checked—as that of the rod should be—by the thumb, at a point about twenty-two degrees behind the vertical, and again checked as it should be at the end of its downward stroke, a certain hit or strain will be felt on the wrist as the momentum of the rod is stopped. The amount of the hit or strain will be an index as to how much the elasticity of the stick, or butt end of the rod fails to blend its vibrating elasticity with that of the arm, wrist and hand. If the same stick or bar be brought backward and forward, and the wrist be permitted to yield to the momentum of the stick, this hit or strain will not be so immediately appreciated, but nevertheless the strain of this hit, though it does not at once become apparent—as it does when it is checked with a stiff wrist under the control of the thumb—will yet affect the muscles which control the wrist and which will be called into play, and the greater the hit or jar, the greater will be the strain and also the fatigue as the day lengthens.

The Action

By far the most important factor which contributes to the perfection or the non-perfection of a trout rod is that which centres round this word—Action. Provided it is made of the best cane, and that its centre of balance is only a few

inches beyond the end of the thumb, when the rod is being held horizontally with the reel on, and the line in position, and that the rod is properly tapered, the "action" of the rod is the principal factor which determines its perfection.

The weight of a good split cane trout rod may vary from three-eighths to seven-eighths of an ounce per foot, up to a length of 9½ feet, without affecting its usefulness or the comfort of the angler. A dry fly rod should be about 9 feet 6 inches in length, and, always provided that the action of the rod when ready for fishing is centred so that no appreciable hit is noticeable in the wrist when the rod is checked in its backward or downward action, the less whippy the rod is the better will be its casting power and its excellence as a dry fly rod.

The Consideration of a Stiff and of a Whippy Action in a Fly Rod

If we can imagine a rod which could be built absolutely rigid from butt to top ring, it would—during the back cast—when the hand controlling it had reached its back limit, have done all it could do as regards transmitting the force of the arm, and would be powerless to affect any farther the backward movement of the line; therefore, unless the necessary lifting and backward impetus to the line had by then been imparted, the back cast would be a failure.

It follows that with an absolutely stiff rod the upward and backward action necessary to effect the backward extension of the line must take place while the hand is moving, and however much force may have thus been applied by the hand, no after assistance will be obtained from the rod, as its backward action will cease with the stopping of the hand action; it has acquired no bend and has therefore no further pull on the line.

Under these conditions the energy employed to make a

successful back-cast with such a rod would necessarily be of a more rapid and violent nature, and, even if effective, would result in a most prejudicial disturbance of the water as the line was jerked backward; the longer the line the more would this fault develop. This of course refers to a perfectly stiff rod.

If absolute rigidity of the rod disappeared, and whippiness began to appear, a less violent jerk would be required to effect the backward cast, and as whippiness increased, the jerking action would become unnecessary and would disappear and devolve into the upward and backward switching movement.

In the other extreme, an excessively whippy rod, on the backward effort being applied, would rapidly acquire such a bend, that the hand would have reached the end of any possible backward extension long before enough energy to conquer the frictional resistance of the water and project the line backward had been imparted, and whatever latent energy had been retained by the rod, it would not be sufficient to extend the line and fly backward to its right elevation with anything like the *vim* required.

The Perfect Rod

The perfect rod for each fisherman should enable him by a movement of the forearm from its horizontal to the vertical position to pick up off the water, easily and quickly, and to extend correctly backward, such a length of line as he may require to use. The relative stiffness of a rod affects its casting powers, and its whippiness affects its delicate adaptation of the force applied in casting, striking, or playing the fish.

The more perfect the rod, the less is the danger of disturbing the surface of the water when making the back cast, or of breaking the fine point of the gut cast when striking.

The pliability of the rod counteracts to a very great extent the fault of snatching the line off the water in the back cast, or of a too forceful strike at a rising fish. But here the advantage of the whippiness of a fly rod ends, and the advantages of a stiff rod have to be considered. Always assuming that in other respects the rod is perfect, its stiffness will permit a quicker and more direct impulse to be communicated to the line both in casting and in striking, a longer line to be picked off the water, a greater length of line projected in casting, and greater mastery over the fish when hooked, a better result when casting against the wind, and greater accuracy. Hence it is that, when the vibrant qualities of a rod are sufficiently brilliant to secure an all round excellence in these latter qualities, and when its balance and action blend themselves into the muscular and sensitive qualities of the forearm of the user—that the perfect rod is recognized.

The Treatment of a Fly Rod

The rod which, in the hands of a skilful and reasonable man, will last for a lifetime, will in the hands of another soon become strained and warped either by playing a fish heavily, striking abruptly when using a long line, or by trying to jerk the line off the water instead of picking it off gradually when making the back cast.

A fly rod should be used only as a fly casting rod, and never as a trolling or spinning one. The stiffer the rod—all its other qualities being perfect—the greater the distance which can be covered and the greater the command when striking and playing a fish.

The casting power of the rod depends on the amount of line which the rod can raise from the surface of the water. The relation of the line to the rod must, therefore, be very carefully considered, and a line whose taper and weight

suits the strength of each rod used by the fisherman should alone be used. The influence of an over heavy line on a delicately actioned rod is just as bad for the rod as is that of a too light line on the pleasure of casting the fly.

It must be remembered when choosing a line that the lighter the tapered line the less strain on the rod, the less disturbance to the water as the line falls and the greater the ease of lifting the line lightly from the water. The usefulness of a line has as a rule gone when the tapered portion is worn out, and as it is the tapered portion which invariably goes first, the belly, or thicker portion of the line, which in other respects will be quite sound, may, if too heavy, be useless for the delicate work on most of our dry fly streams.

Tournament Rods

However interesting Fly and Bait Casting Tournaments may be, it is very questionable whether they have really tended to improve either the methods of fishing or the construction of the fly rod. Only a few competitors enter for these contests, and but little advance in the art of fly casting has, so far as I know, been evolved as a result of these tournaments. For a maker to claim that his fly rods must be the best weapons to fish with, because one carefully selected rod, out of several thousands which he builds, has in the hands of the most experienced fly thrower he can get to use it, projected a fly, or thrown a bait, etc., a few inches or a few feet further than another of his own rods, or the rods of other makers, is as absurd as it would be for the man who makes the longest cast of a fly, etc., to claim on this account any superiority in his methods of fishing over other men.

While tournaments may be used as a convenient means of advertising rods and rod sellers, such distinction has

led many inexperienced buyers to invest in rods which are neither suitable nor pleasant for fishing purposes.

Points to Remember when Selecting a Rod

The greatest care, nay—caution—should be adopted when purchasing a rod.

It is better in every case for even the most experienced fisherman to take home for approval the rod he may fancy in a shop, and to try it with a line for some ten minutes over water, or on his lawn, and also compare its casting properties with some well-tried rod, before deciding on its purchase. If the novice cannot by such means select one, he should obtain the advice of some experienced friend before he finally decides on his rod.

The action of a rod cannot easily be judged in a shop. The muscles which are used in such a trial are unfatigued, and the space and time for the trial are both too limited to permit of the ill effects of the faulty action of an ill-made rod to be realized, or those of a good rod thoroughly appreciated.

If it were possible by machinery to convert a bamboo from its virgin state into a split cane rod in its finished condition as seen in the shop, a standard rod might, under certain circumstances, be obtainable. But bamboos differ, and are not always of an exactly equal degree of excellency, and however even or similar in appearance a shipment of bamboos may be, each bamboo will have its own individual quality, strength and elasticity, and therefore, for this reason alone, if a machine-made rod were possible, a considerable difference would exist in each rod. When it is remembered that not only do bamboos differ—that more than one man is employed in making each rod—that each of these differ not only in their sense of touch, experience, and judgment, but in their moods and capabilities, and also

that the meteorological conditions vary, and consequently influence so differently the building of rods, it will be recognized that no two rods can—except by an accident—be made with an exactly similar degree of action, balance weight, elasticity, stiffness and vibration. It is by the educated senses of the experienced fly fisherman alone that an accurate judgment—as to the various factors which go to make a good rod—can be formed and such a rod selected, that at the close of a day's fishing it will be found as effective and pleasant to use as during the first few moments in which it is handled. Excellent as are my rod builders, and thoroughly as they devote themselves to the work of building my rods, carefully as I test, approve and pass all those rods on which I allow my name to appear, still each rod—although all come into one delightful class—has its individual balance and action, which makes it heavier and stronger, and which inclines it towards perfection or the reverse.

To claim, therefore, than any fishing tackle firm has some secret knowledge or method as to rod building, which—without that personal testing which I consider necessary—will ensure that every rod they may label with some particular name must possess a similarity in its good—or bad—qualities, is merely bluff, but it is bluff which has deceived, and may still continue to deceive, the novice. Further, it has often this bad effect—that a beginner, purchasing a rod, the name of which is supposed to be a guarantee of its excellence, may probably find his casting spoilt and his pleasure marred by a smart looking rod which, after an hour's fishing, will become, from its action on the wrist and forearm, both difficult and painful to use.

While we owe to the Americans the introduction of split cane—that is split bamboo—as a material used in the construction of our fishing rods, several of our rod builders may now claim to produce rods equal to, if not better than

the best American ones. Hardy Bros. may be regarded as one of the leading pioneers in the building of split cane rods in England, but during the last six or seven years several other firms have gained public favour in this particular industry, and no one firm can with justice claim any pre-eminence in the production of either good salmon or trout split cane rods. It is to some of our smaller manufacturers that we now owe some of the best and choicest of our rods. Redditch has maintained its old-time superiority in the manufacture and construction of fishing rods, its split cane rod industry being the largest in the world, and it is well for the public to remember that the majority of fishing rod and tackle businesses in London are selling Redditch made rods, and that some of those who profess to build their own rods are, and have been relying for many years, on the excellent cane rods built there.

The Virtues or Otherwise of a Dry Fly Rod

The excellence of a trout rod lies in this—that not only should it be capable of conquering the fish you hook, but it should possess such a well-balanced, tempered action and weight that it will, when in use, so blend its action into that of the forearm as to appear, so far as the sense of feeling and touch are concerned, to be but a continuance of the forearm itself.

There is nothing more certain than that tournament casting must be regarded in the light of a new sport, which while interesting, and maybe useful, so far as records are concerned, tends but little to improve the practice of fishing. The records now made by the best long distance casters have long since passed the limit of usefulness, and especially is this so as regards fly casting. The rods used in casting tournaments, not only in this country but elsewhere, for distance casting, are not rods with which one would

choose to fish. A heavy rod may be useful—to a man who is strong enough to cast with it—when it is only required to make a very long cast, or when either from weeds, heavy fish, or owing to the vicinity of dangers, drastic measures have to be adopted after a fish has been hooked, but in my opinion a nine foot six inch single-handed rod is about the average length of a really useful wet or dry fly weapon, and for comfort as well as delicacy the action of such a rod should blend its virtues into those of the forearm.

It was with these ideas in my mind, and because it appeared to me that a perfect Dry Fly Rod was wanted, that in 1908 I designed the first "Fred G. Shaw" rod, which Messrs. Hardy Bros. eventually succeeded in manufacturing to my satisfaction, and which they continued to make and sell until I reserved to myself alone the privilege of using my name on my own patents and designs.

CHAPTER XIII

THE LIFE OF THE SALMON

The instinct of the salmon—The life of the salmon—The Alevin—The salmon fly—The appearance of the Parr—The Smolt—The aim of Nature—The smolt in salt water—The Grilse or salmon—The return when injured—Spawning—Rejection of food when captured—Aggressiveness of salmon—The sustenance of salmon—The author's theory—Other theories—The gastric glands of salmon—A general view.

The Instinct of the Salmon

From the moment it leaves the friendly shelter of the redd, amid the pebbles of which it has hatched, has absorbed the yolk-sac attached to its body, and passed from the alevin to the parr stage, the life of the salmon is full of interest to the naturalist, peril to itself, and danger to the water insect and smaller life with which its parental stream abounds.

No watchful care guards its early days or assists its first attempts to obtain food or the shelter so necessary to its tender and defenceless condition. As it emerges into the rush of the stream from the comparative safety of the redd, a tiny inch of delicate but perfect fish, it is swept into a world teeming with watchful and ever-voracious enemies. It is by no means helpless, and instinct teaches it to dart at once for the protecting shelter of the nearest root or pebble. In every after moment of its eventful life, in every fresh danger, until it attains to its full growth, it is to the natural wisdom of its own instinct that it owes its safety. This instinct is the guiding influence

of its whole life, and is as vivid and compelling in its alevin state as when, a full-grown salmon, it rubs your Jock Scott from its jaws against some pebbly bottom, or saws through your cast against the rugged rock at the foot of which you have perchance permitted it to sulk, and plunges downstream with your broken trace trailing from its jaws (see Frontispiece). Strengthened though this instinct may be by after-experience, it represents to the salmon an equivalent for the parental education so wonderfully and carefully imparted to most animal and bird life, and to all humans prior to the age of maturity.

No education, indeed, no matter how complete, could compensate the salmon for the absence of those mysterious impulses which influence its life, which cause the smolt's migration from, and return as a grilse or salmon to, its native waters, or for the wisdom which directs it as it leaps for the first time up and amid the dangers of the towering fall, which sends it, when wounded, away from the deadly contact of the fresh-water micro-organisms to the healing power of the salt water, or guides it back to the mouth of its own particular river after wandering over the trackless bottom of the ocean.

The following remarks anent the habits and life of the salmon will, perchance, contain some matter new to those who may be, either from experience or study, familiar with its life history; but they are written mainly for those who may be anxious to acquire some general information as to the fish they are so anxious to capture, and with the hope that such knowledge as the author has acquired during many years of fishing experience may be of use to them when they find themselves face to face with some unexpected difficulty or problem connected with salmon life.

Those theories, which offer some new solution for well-known phenomena associated with Salmonidæ, are suggested

by the most probable and natural influence of their own instinct.

The Life of the Salmon

If the reader should, in the early spring, be wandering beside the upper and more shallow waters of any salmon river, his attention may possibly be attracted to certain mounds of gravel rising from the bottom of the stream. He will observe that these mounds are kept clean and free from mud by the sweep of the current in which they are situated, and to which they offer some resistance.

These gravel mounds are called salmon redds, and they are formed by the female salmon when spawning.

During the autumnal and winter spawning season the female fish, after first making a depression or trough in the gravel and driving out all muddy or weedy sediments by fin and tail action, deposits her ova in the depression she has thus made. The eggs, which are heavy to a certain degree, will remain on the gravel when thus deposited, and are, or should be, fertilized by the attendant male salmon, after which this trough is either intentionally or accidentally filled up by the disturbed gravel as the fish continue to spawn up-stream, and thus the eggs are safely buried below perfectly clean gravel matter, from which all deleterious substance, such as silt and mud, has been swept away, by the struggles of the fish when spawning, assisted by tail and fin action.

If fertilization does not take place the eggs absorb water, and become opaque.

No matter how cold and empty may appear the river you are watching, hundreds of thousands of tiny lives are healthily pulsating beneath these stream-swept redds, and steadily, as the temperature of the river rises, are becoming daily more capable of breaking through the elastic covering

which now encloses them, and of emerging as alevin amid the crevices of their pebbly surroundings. Even here, while yet in the egg in the apparent security of the redds, their tiny existence is continually threatened. Fish may root them out; the larvæ of the stone-fly, caddis-fly, May-fly, and dragon-fly may penetrate the crevices of the redds, and seize them in their voracious grasp; the water-rat and moorhen may gobble them up, floods may destroy them, or droughts may leave the redds high and dry, and the ova exposed to frost or dry air. All these dangers are possible, and many of them are but too common.

But haply none of these dangers may disturb the eggs in the redds we are observing. Each egg is now in itself a separate and detached entity, and as such is individually affected by its own particular and immediate surroundings. In appearance it is a translucent elastic ball, less than ¼ inch in diameter, of which a gallon measure would hold some 25,000, about the number deposited by a 27-pound salmon during any one spawning season; and yet, think you, what possibilities may lie in any one such minute atom! As I write this I have lifted my eyes from my paper, and they have rested on the skeleton head of my 50-pound Norwegian salmon, and as I recall the splendid fight he made years ago, it seems difficult to picture him as being once but one of the wee, small atoms now pulsating beneath the gravel covering we are considering.

The temperature of the water in each salmon stream is the principal factor which determines the period during which the young salmon remains in the egg.

The Alevin

This period will, of course, vary with the particular warmth or coldness of each stream: with a temperature of some 43° F. the eggs may hatch out in about 100 days,

while with a temperature of 36° F. the eggs will take about 115 days. It is supposed that after about 160 days the egg may be considered dead, or incapable of producing living alevin. This I am inclined to doubt, Nature under adverse circumstances extending life and preserving the vitality of the eggs in the moist atmosphere of a redd even when exposed by the lack of water in a rainless season. Cold retards the development, but does not deprive the ova of their vitality, so long as the eggs are moist and in a moist atmosphere. From ten to fifteen weeks, may, however, be taken as covering the average period of incubation, provided that no abnormal circumstances arise to check the process. At the end of this period the walls of the egg break open, probably owing to the growth and strength of its inhabitant, and the alevin emerges. It is supposed by some that the young fish nibbles its way through the shell. As, however, the mouth of the alevin does not appear capable of a muscular movement sufficiently great to effect this, I think this must be a purely analogous supposition based on the known action of young birds, etc. For a period of about five weeks the alevin generally remains hidden amid the crevices of the gravel and pebbles forming the redd. After it has left the egg, its food is provided by the yolk or umbilical sac attached to its body, which not only hinders its movements and compels it to remain within the shelter of the redd, but provides it with sufficient food to sustain life and add to its strength and growth (see Plate XXVII).

The Salmon Fry

Once again a higher or lower temperature plays an important part in shortening or lengthening the alevin stage of the salmon fry. At the end of this stage, the length of which varies from five to eight weeks, it has greatly increased in size, and measures from 1 to 1½

PLATE XXVII.

THE PARR.

THE ALEVIN.

THE FRY.

STAGES IN THE LIFE OF A YOUNG SALMON.

inches in length. As the last vestige of the sac disappears the alevin existence is ended, and the fry stage is entered upon. The tiny fish now begins to feed upon the minute water insects, etc., surrounding it as it slowly works its way upward or outward by gentle degrees to the surface or side of the redd, whence as it emerges it is possibly at once swept away by the current, and unless it can find some immediate shelter will most probably fall a victim to its numerous and watchful foes. But, tender and inexperienced as is the young fish, it is by no means lacking in wisdom. Instinct guides it, and, luckily eluding its many enemies, it finds its way to the nearest shelter, of which it immediately takes advantage, and happily secures, below a pebble or under some neighbouring root, a safe and comfortable home for the early days of its parr life.

It will be, then, in the shallows of this river, near its original home, that it remains until the following, or perhaps the second or even the third, spring after its birth.

The Appearance of the Parr

His growth is very rapid, and he gradually assumes the delightful beauty and colouring by which the parr is recognized. Four months after leaving the egg he will measure 2½ inches, and in six months 3½ inches. He is slimmer, more graceful and more beautifully bright than the troutlet, but with the exception of the posterior or adipose fin, which has, unlike that of the trout, no shade of vermilion edging in it, he is similar to a troutlet of a like size. The transverse finger-marks common to the parr, about eleven in number, are frequently found on young trout, while the bright vermilion spots so dearly beloved by all trout fishermen are, previous to the smolt stage of the salmon also common to both fish.

The food during the parr period consists of the water-

insect life, the young of other fish, worms, small eels, and water shrimps ; and when the supply has been plentiful it will have grown, until in the following spring its length is from 5 to 7 inches, and its weight from 2½ to 3½ ounces.

The Smolt

In the first, second, or third spring succeeding its appearance as an alevin a gradual change takes place in the parr as its smolt stage approaches. It seldom rises at a fly, its body gradually acquires a scaly covering, and the beautiful markings of the parr state disappear beneath this new and protective armour. (See Plate XXVIII.)

During these spring months it and the other parr who have also changed their appearance and entered the smolt stage, urged by that instinct which has so far guided them in safety, with one accord make their way rapidly to the sea.

Mostly following the sides and shallow parts of the stream, but in the dangerous rapids keeping well down in the river channel, they drop down stream towards the sea ; at times they may be seen flashing like bolts of silver down the cascades and shooting over the caps of the big falls. Passing gradually from the purer and colder waters of the upper river into the muddy and warmer waters of the tidal reaches, they finally emerge into the cool, food-abounding paradise of their ocean inheritance.

A considerable difference of opinion, however, exists as to this change of the parr into the smolt—not only as regards the percentage of fish in each year's hatch which leave in the spring of the following or succeeding year, but also as to the sex of those which change during these years.

It has so far been impossible to determine this question with certainty, even in regard to the results of each particular year's hatch of domesticated alevin. How much more difficult is the problem where wild fish have to be

SMOLTS WITH THEIR SCALES PARTIALLY STRIPPED OFF AND SHOWING THE PARR MARKING

Photo kindly lent by Mr. P. D. Malloch.

considered. As regards wild parr, their change into the smolt stage should bear an intimate relationship to the particular locality and the food, as well as to the meteorological conditions of each season. In unconfined water, therefore, close observation can only attempt approximate conclusions as to the times at which the parr of any particular season's hatch change into the smolt, and as to the sexes affected at the various times of this change. It may be assumed that meteorological conditions affect the periods over which the parr stage extends, and it is not improbable that the male parr is, as a rule, the first to leave that state.

The Aim of Nature

There is, so far as I know, no evidence to disprove this suggestion, while there are many arguments in favour of its consideration. Nature and the laws of natural selection are opposed to inbreeding, the aim of Nature appearing always to favour the union of the sexes of different stocks. The migration, therefore, of the male fish in the first spring would, on his return from the sea, throw him into contact with the female of another generation, and most probably of other parentage, and so on.

It may be assumed that a minority of parr in any one season's hatch migrate after one year's river life, that a large majority of those left behind as parr migrate after two years, and the small remainder, probably the weaker ones, after the third year.

But, whatever may be the approximate facts, food and temperature will be serious factors in the development of the smolt and the time of its migration to the sea.

We will now follow the smolt of the first year as he darts with a multitude of his fellows from the river into the sea.

He has at this time all the well-known characteristics of the salmon both in appearance and habits, and he is yet

but a little fellow who has to depend entirely on his own resources during his three to five months' stay in salt water. Luckily for him he is full of life and vigour, and his river training has given him wonderful speed and quickness, while his good fairy, Instinct, is always with him.

The Smolt in Salt Water

Nothing is definitely known as to the wanderings of the smolt after reaching the sea, either as to the period which elapses before he leaves the company of his fellow-smolts, or of the distances to which his travels thereafter extend. What we do know is that the chemical properties of the salt water are most favourable ; that his enemies are numerous and voracious ; that his food is plentiful and wonderfully nourishing, and his appetite abnormal ; that, escaping from the ogres of the wonderland in which he travels, he increases in size and strength in a most remarkable manner ; and that, after satisfying his feeding instincts and stuffing to repletion, he is called by his fairy godmother, and guided amid the hills and valleys, the trackless plains and forests of the ocean floor, back to the home he left. It is possible that, as he nears his destination, some perceptible flavour of his own river may entice him nearer ; but whatever the ties may be which draw him home, he may be found in the following year a full-grown grilse of from three to six pounds in weight, with numbers of other grilse of his own season, in the lower reaches of the salmon rivers, waiting for a further call to take him away back to the upland stream of his birth.

During the last six years owing to the development of the science of scaleology—to coin a new word—it has been conclusively proved that a grilse seldom returns to his river during the year in which he goes down to the sea as a smolt, and that if a fish does happen to do so, it does not

acquire the average weight which grilse are supposed to have, viz., from three to six pounds, but would be of considerably smaller size.

The Return to Fresh Water

There are varying periods in which the smolts of any one year's descent may return to fresh water.

The first of these to return are then known as grilse, and they may appear at any time from June to December in the year following their descent as smolts to salt water.

The next to return are known as small spring fish (salmon). These will appear in the spring following that in which the grilse return, and these salmon will in their turn be followed in the summer and autumn by the summer and autumn salmon respectively.

The dates of the return of the salmon for the first time to their own river should not be considered as being due to any other cause than that the opportunity and the desire to run are co-incident. When circumstances are favourable and the fish are willing, then will they make their up-stream run but when circumstances are not so favourable, or when they are not desirous, they will not do so.

These varying times for the return of salmon to fresh water have been alluded to by different writers as divided immigration, and by some have been considered as denoting different types of salmon.

The Grilse or Salmon

Here again meteorological conditions affect his movements, and when the condition of the water in the river up which he has to ascend is favourable, his instinct again sets him going. It is now that all the strength and stamina won during his salt-water experience is required to carry him safely through the perils and the difficulties of the

up-stream run. Not only has he to elude the wiles of the fishermen and the onslaught of the otter, but he has to fight against the bewildering turmoil of the rapids, and the more deadly and difficult ascent of the falls down which, as a smolt, he was carried a few months before. It is here, faced with the thundering fury of the towering fall, that the difficulties and dangers of the journey culminate. It can only be this ever-compelling instinct which nerves him to encounter such dangers, and which also prompts the tremendous effort, and indicates the only place in the descending waters which he must strike in order to gain the haven above.

But with the grilse or the salmon the attempt is made, and though some may be killed and others stunned and torn, yet the rest conquer, and—instances of the survival of the fittest—are soon proceeding on their way up-stream. It is on this upward journey that the grilse of four pounds may perchance pass the smolts of three ounces—members of his own redd and hatched from the same batch of eggs—on their way down to salt water.

The Return when Injured

When hurt in his upward course to the spawning grounds, instinct again impels immediate action. Stronger and more imperative than spawning is the instinct of self-preservation. Fatal would be a stay in fresh waters with that gaping wound in his silvery side, for most assuredly would the zoospores of the dreaded saprolegnia enter the abrasions in his skin, and speedily destroy him.* It is only

* The *Saprolegnia ferax*, the fungus mentioned above, is said by Mr. J. Hume Patterson, in "The Cause of Salmon Disease" not to be the fungus of the salmon disease, the latter being due to a different bacillus—the Bacillus salmonis pestis—which taking advantage of wounds or abrasions in the exo-skeleton of the Salmon, bores its way into the tissues of the epidermis, and dermis. It appears to be carried by the water and to affect fish other than salmon.

in the health-giving waters of the sea that a cure can be effected, and instinctively, therefore, will the grilse or the salmon turn and make his way to the sea whenever his scales are destroyed and his skin torn. Thus it is not unlikely that the actual spawning of a salmon may not take place until it has spent four or five years in the sea, and this delay may be accounted for by accidents which happen to him on his former spawning trips, and compel his return to the sea.

The smolts of any one's year's migration will provide spawning salmon for any one of the five following years. The great majority of the fish of each migration which do return, will do so during the next three years, while the remainder of the returning fish from the same year's migration will do so in the fourth or fifth succeeding year. No other reason can be given for the irregular return of each season's migrating fish than that due to a provision of nature to insure a more certain distribution or mixing on the spawning beds of the progeny of different salmon.

Salmon are irregular both as to the time of their return and also as to the river they ascend. The early or late ascent peculiar to different rivers—by which they are known as early and late waters—is due to their temperature and local climate, but each river may vary as regards the exact date at which salmon run, being earlier or later as the river alters in the volume of its flow.

Spawning

To return then, to our grilse or salmon; he has at last reached the gravelly beds of the upper stream of his own river. Natural selection, possibly assisted by repeated combat, will decide his mate, and the female salmon, when her condition is ripe, lying on her side, will with lateral

movements of tail and fins, sweep the sand and fine gravel away from her body, and thus form a hollow trough, into which she proceeds to deposit a portion of her ova, the male fish meanwhile acting as guard, keeping off other male fish, and also the predatory attacks of troutlets, parr, etc. Directly the female has finished each batch of ova, the male darts over and fertilizes them with his milt, and the gravel is then swept over them.

Both male and female salmon decrease in weight after spawning, and are then in the kelt or unclean stage. The greater the time spent by the fish in fresh water prior to spawning, the more discoloured does it become and as a kelt it will exhibit a disgusting comparison to its condition as a fresh run salmon. It is not impossible that a so-called "well-mended kelt" may owe its comparatively clean condition to the fact that it has been but a short time in fresh water, or that it is a late run salmon which has not spawned in a natural manner, but which has spent or otherwise discharged its ova, and has not yet fallen back to the salt water.*

Those fish which have been for several months in the river, will be of a dun, or dirty looking red colour, or even of a black appearance, and under whatever circumstances they have discharged their ova they will be exhausted and spent, and exhibit on their scales the so-called spawning marks, which are in reality the decrepitation of portions of the scale owing to the genital changes and poor condition to which they have arrived.

It must also be remembered that in rivers which offer no great difficulty to ascending salmon, such as the Wye, fish running clean and bright from the sea, very late in the season, and spawning in December or January, might not,

* For a full discussion on this point see the chapter on the Scale Markings of Salmon, p. 249.

if caught immediately after spawning, exhibit any great amount of discoloration, etc., but they might be, and very often are treated, as kelts which have recovered their clean appearance after having deteriorated prior to spawning. In other words, the so-called bright and clean kelts which are captured in February and March may never have been in any other condition since leaving the sea, and cannot be regarded as "well-mended kelts."

A great deal of literature has been devoted to the problem affecting the *clean* salmon's pursuit of all moving objects after it has left the salt water, and various explanations have been advanced to account for its apparent appetite in fresh water prior to spawning. The changes which occur in the stomach and alimentary canal of a fresh-run salmon while in fresh water preclude its taking food, and there have been few authentic cases of a *clean* fish ever having been discovered in fresh water with food in its stomach.

Rejection of Food when Captured

A salmon when in fresh water appears to pursue and take in its mouth any moving or novel object which it sees, unless the object be too big, or the salmon be frightened or warned by some former unhappy experience. What is the reason for this action? Some, ignoring the physical changes in the alimentary regions, declare that the salmon takes the food into the stomach, but that directly it is hooked, or finds itself in a net, it discharges the entire contents of the stomach.

Mr. H. Cholmondeley-Pennell advanced the theory of the rejection of all food as a possible solution of the empty condition of the salmon's stomach when caught in fresh water, and instances a case where 716 salmon caught in a net—in salt water—were seen to discharge quantities of small eels as the net approached the shore. This,

however, only affects the question of the fish in salt water when their stomachs are in the normal condition, and therefore this evidence of Mr. Pennell's does not help matters.

Aggressiveness of Salmon

Salmon in fresh water do not appear to be hungry but rather savage, and their attitude is more aggressive than voracious. The leaf floating on the surface of the stream is seized, bitten, and rejected; the lure of the fisherman is seized, and, so far as my experience goes, is never swallowed. I have never hooked a clean salmon, even when spinning with the natural minnow, save in the mouth, and generally in the tongue or jaws; nor have I heard of the triangle being found embedded except in the mouth or upper part of the throat of a clean salmon. It is certain that when a salmon is feeding it neither masticates nor attempts to masticate its food; indeed, its teeth are unfitted for such a process, and directly the prey is seized it is swallowed. This alone should dispel any belief in the theory that a clean fish feeds in fresh water; for if it did so, the bait, when it was seized, would be immediately swallowed, and innumerable cases would occur in which the salmon would have to be cut open in order to liberate the hooks attached to the lure. One powerful argument which has to be met is, that salmon are frequently caught with worms as bait, and if the hooks to which these worms are attached were found in the stomach of the salmon, an even stronger case would have to be answered; but so far as my information goes, these hooks are not found in the stomach.* Eels, and worm-like larvæ are as great a danger to the salmon ova and alevin as any other denizen of fresh

* A hook baited with worms would be the most likely lure to be swallowed. Their slippery nature would suggest their being more easily admitted into the congested alimentary canal than other classes of food.

water, and thus their destruction by the salmon may be regarded as natural.

The Sustenance of Salmon

Salmon, it has been affirmed, when in fresh water, live on their cream—that is, the adipose matter distributed through their body—until spawning operations are over, even as the hibernating fish live on their fat until their winter is past. The loss of the appetite of the salmon is natural when the object of their visit to fresh water is remembered—that is, to spawn. The insect and fish life of a river is insufficient to sustain an inrush of healthy feeding salmon with appetites such as are common to these fish when in salt water; hence if their appetites continued all living creatures in the fresh waters of the salmon river might possibly be destroyed, and the salmon would not, in succeeding years, leave the salt water, where food is plentiful, and enter an empty river, however strong their spawning instincts, and for this reason—an appetite would imply a necessity for food, which food would in such a case be unobtainable.

The Author's Theory

What, then, causes them to pursue and seize moving objects prior to spawning?

It has been shown that the guiding influence of their life is instinct, and instinct in this case makes them destructive. A similar impulse pervades all Nature, and teaches the parent to destroy or to drive off any creatures that are likely to endanger the safety of its young. Salmon enter fresh water for one purpose alone, and instinct teaches them that all moving inhabitants of fresh water constitute a future danger to the well-being of the defenceless young which they must leave behind.

I have, when well concealed from sight, while watching salmon, quietly thrown in preserved minnows, worms, and snails. These have been seized, chewed, and, as far as I could see, invariably rejected by the salmon. Nature, despite its immutable laws of supply and demand, is rarely destructive for destruction's sake, and the salmon's attack on moving objects is actuated by the absolutely natural law which dictates the safety and survival of the species.

As the spawning season of trout approaches they lose their appetites and their condition, and though at times food is doubtless swallowed and enters the stomach of the trout, it appears to lead to trouble. The few cases in which it is stated that food has been found in the stomach of clean salmon when in fresh water may be regarded as the exceptions, which justify the contention that salmon cease feeding when about to spawn.

Other Theories

Those who hold that salmon feed when in fresh water account for the accepted emptiness of their stomachs as being due either to the immediate assimilation of the food they swallow, owing to the powerful action of their gastric juices, or else to the assumption that salmon vomit forth the contents of their stomachs directly they are hooked or netted, and before being handled. This school of thinkers admit, however, that the appetites of the fish are less when in fresh water than in salt, and that food is but seldom found in the stomachs of salmon save when they are taken in salt water. If the appetites of salmon are stronger in the sea, and if food is partaken of in greater quantities than when in fresh water, it follows that the gastric juice should, when the fish is in salt water, be proportionately more rapid in its action and more powerful in its character,

in order to enable the fish to assimilate the greater amount of the food they then take. Only, however, on the reverse assumption—that in fresh water the gastric juice is increasing instead of diminishing in its power—can the members of this school of belief explain the theory they advance, *i.e.*, the rapid assimilation of the food the salmon swallows in fresh water, while still having to admit, that obviously the gastric juices have had no such rapid solvent effect, at any rate in relation to the food-evidence they advance in order to prove their contention.

In order to justify his belief that salmon feed while in fresh water, a contributor to a sporting paper recently related the following facts: A salmon of 14 pounds—presumably a fresh-run fish—was killed and taken home, and on being opened was found to contain a rat in its stomach. This rat—which is the evidence he advances that salmon feed in fresh water—must have been swallowed some time before, but it had not, apparently, suffered from the attack of the gastric juices which this writer claims as being so powerful a solvent that "any food that is swallowed is almost immediately assimilated." Neither had it been vomited, as it should have been if the vomiting theory held by others of his opinion can be accepted as accurate.

In a second instance, he states that a *huge* kelt was captured in his presence which had in its mouth a partially *swallowed* ¼-pound trout, perfectly fresh and apparently just seized. The head and shoulders had been reduced to a mere pulp, and he considers that the rapid action of the salmon's gastric juices accounted for the pulp-like condition of that portion of the trout even before it reached the stomach of the salmon, for he states that the tail end, from the dorsal fin, was uninjured. The trout in this instance cannot be taken as proof that the salmon swallows food, but only that he would like to, and apparently makes the

attempt while in fresh water. Now, if the salmon's stomach was in the normal feeding condition this small trout should have been completely swallowed by the huge kelt, even as the rat was swallowed by the small salmon; in which case not the head only, but the whole of the trout would have entered the stomach of the salmon, and would have been reduced to pulp. Salmon have been found in estuaries with full-sized herrings in their stomachs. If they are capable of swallowing full-sized herrings, it is obvious that a huge kelt would have no difficulty at all in swallowing a ½-pound trout. The rat, however, found completely in the stomach was undigested. These contradictions may be taken as samples of the proofs (*sic*) and arguments advanced to show that not only do clean salmon eat and swallow food, but that this is the aim and object of their onslaught on things living and moving in fresh water. Two totally dissimilar results of swallowing, or attempting to swallow, food are advanced to prove this theory; in neither case are these arguments successful.

A fish will often seize another which is too large for it to swallow. A fish so seized enters the throat of its captor, and apparently sticks in that position; fish have been at times caught on a lure in these circumstances. One end of the smaller fish, when removed from the larger one, is more or less in a pulpy condition, or at least shows some signs of decomposition, and it has always appeared to me to be an open question as to the causes which have produced this condition in the smaller fish. The contributor to the *Fishing Gazette* mentioned above considers it due to the action of the gastric juices, and if this is so these gastric juices must have been in the throat, and not in the stomach; he ignores the effect of the vomeral bone and teeth, throat pressure, and muscular action, to say nothing of the laceration of the other teeth.

While fishing Mr. George Beck's stretch of the Evanger River, Norway, in 1899, Mr. Arthur Wellington Naylor hooked a fresh-run 20-pound salmon forty miles from the sea, and having no lice on it. The triangle of the lure which he had been using was fixed in the upper and lower jaw of the fish, completely closing its mouth. After the fish was gaffed, the tail of a parr 4 inches long, half digested, was seen protruding from its mouth. This happened in July. This evidence is important. The parr had apparently been swallowed, and the fact that no sea-lice were on the salmon argued that the salmon had been some days out of salt water. It is by no means an uncommon thing for salmon to clear forty miles of the lower stretches of a river with sea-lice on them. I have killed salmon fifty miles from the sea having sea-lice on them. The deduction which can be made from this fact is that this particular salmon had been some little time in fresh water; that either during that time or after it left *salt water* it had taken and kept in some part of its alimentary system a parr, which when hooked it had endeavoured to disgorge; but, owing to the fact that its jaws were firmly held together by the triangle, the parr when rejected from the thorax, could not pass between them. This is an argument in favour of the assumption that salmon do at times take matter as food while in fresh water, and that this food has the appearance of being partially digested, but not that it enters their stomach.

The Gastric Glands of Salmon

Dr. J. Kingston Barton states definitely that the digestive organs of salmon taken with rod and line, and examined by himself, were "absolutely normal." This from such an authority appears conclusive, in so far as the healthiness and normality of such organs are concerned, but it does not of

necessity imply that these organs were active, or inclined to be active; while healthy, their powers might still be in abeyance. If the digestive organs of a hibernating animal were examined, they would undoubtedly be found in a normal condition, as would the digestive organs of Dr. Sacchi during the course of one of his long fasts.

If, indeed, the gastric glands of either the bear or the doctor were actively discharging their contents on to the delicate tissues of an empty stomach, it is certain that the bear would not sleep, and that the doctor would not rest, during the fast. The gastric glands and the juices they supply may be regarded as the agents in preparing the nutritive properties of food for conversion into blood. In certain physically or mentally unhealthy conditions of life, the gastric glands will at times discharge gastric juice after the stomach has emptied itself, generally causing thereby stomachic trouble and may be insomnia.

In healthy fresh-run salmon we may assume that the digestive organs, though normal, are merely inoperative. The salmon have ceased to feed, the stomach becomes empty, and, as a consequence, exhibits a very natural contraction, sufficient to cause a difficulty in receiving food.* On this latter and important point many writers seem to agree, while a small minority of fishermen continue to assert that the stomach does receive food, and that the salmon does in reality continue to feed when in fresh water. A feasible suggestion has been advanced by Dr. Barton to account for salmon apparently coming on the feed when in fresh water. He says: "Knowing that the digestive organs

* When those who have become seriously exhausted from want of food, either through accident as in the case of shipwrecked sailors, or through design as in the case of Dr. Sacchi, the alimentary passages into the stomach contract, and when feeding again commences, unless nourishment is administered in small quantities, and in an easily assimilated form, great pain and the gravest results may occur.

are only in abeyance, one can easily understand why a tired and *slightly hungry* fish will dash at a morsel that simulates some food of its liking."

The pursuit of the lure by a salmon may possibly be induced by an appetite, which is excited as a result of fatigue, but which appetite it is prevented from satisfying. The instincts of spawning have induced it to leave the ocean in which it has been feeding, and were the stomach, etc. to continue to receive food the gratification of appetite might deter the salmon from the arduous work of ascending its river. Hence it is not improbable that Nature by preventing it from swallowing food, turns its attention once more to the up-stream journey.

Salmon continue to feed, *i.e.*, to take the lure, for some days after they have entered a new pool, and that in most cases long after any physical exhaustion, produced by the effort, would have disappeared.

A General View

Salmon, like trout, may feed prior to and when spawning, and they may or may not at such times swallow food. Their gastric juices may sometimes act with lightning result, then again at others, as in the case of the rat, be inoperative, and they *may* both feed and swallow during a period when others of their kind cease feeding ; but such isolated cases as are advanced, even if they be considered as proved, should be regarded as exceptions tending to prove a general rule. But that salmon do not feed, in the general sense of the word, prior to or during their spawning operations is, I think, acknowledged by most people, and hence the pursuit of the denizens of fresh-water may be due to the instinctive desire to preserve their species from the inevitable dangers of any attack, and therefore my theory may be worthy of some attention.

It may also be a reasonable supposition to imagine that the salmon, whether hungry or not, and whether capable of swallowing or of assimilating any food it may seize, may be still influenced by the feeding *habits* which have been so strongly developed during its visit to salt water, and that, continuing the attack on all moving objects, it unconsciously fulfils a natural duty which tends to the future safety of its young.

CHAPTER XIV

THE SCALES OF THE SALMONIDÆ

The scales of the Salmonidæ—Scale growth—The physiological changes in the condition of salmon—Discoloured fish—Estuary of the Severn—The Wye—Icelandic rivers—The respective influences of salt and fresh water on salmon—The question—The ova of salmon—Mr. Hutton and the Spawning mark—The varying number of rings on a scale—The examination of a salmon's scale—The scales of salmon from the river Add—The Add and the Wye—Mr. Gathorne-Hardy—The river Awe—Synopsis.

It should not be foreign to the scope of this work to consider the interesting problems which are associated with the markings on the scales of the salmonidæ. This study, though in its infancy, has already added much knowledge concerning the life and habits of our salmon to the pages of natural history.

We are indebted to the pioneers of this new science—naturalists and writers such as Dr. Hoffbauer, Dr. Günther, Messrs. Johnston, Hutton,* Calderwood, Malloch, Dr. Masterman, Dr. Dahl, Professor Hickson and others, and to the interesting articles which have appeared in *The Field*, *The Fishing Gazette*, *The Salmon and Trout Magazine*, *The Scottish Field*, etc., for the data on which the greater portion of this new science is based.

It is owing to my analysis of such data, supplemented by my own experience and from the information I have obtained from those in control of the netting operations in our big rivers, that I have ventured to differ from certain conclusions which have been drawn from the markings

* The careful research and instructive data given in Mr. J. A. Hutton's article in the *Salmon and Trout Magazine* are particularly valuable.

on the scales of a salmon, and which conclusions in my opinion prevent the life history of the salmon from being accurately determined.

The Scales of the Salmonidæ

These scales are known as cycloid scales. They grow from folds or pockets in the skin, as small thin and transparent flaky pellicles of a homogeneous character, invisible to the naked eye.

They are developed in the early life of the troutlet, or the parr, as soft and pliable additions to the epidermis or outer skin, and as the development of the fish takes place they gradually harden and become as characteristic as shells, nails, claws, hair, and the exo-skeleton coverings of other living creatures.

The first pellicle forms the nucleus of the scale, and this is being continually added to as the fish grows, each fresh increase extending itself in all directions in the same plane, and slightly beyond the edge of the preceding addition.

When the scales of a maiden fish are removed, and placed under a lens, each growth appears as a more or less noticeable band extending beyond, but concentric to the edges of all the preceding laminæ.

It will be seen that from these markings we can, until decrepitation has occurred, deduce the past history of the life of the salmon. The width of the protruding edges of each newly formed lamina will depend on the growth of the fish, *i.e.*, on the amount of skin surface which has to be protected; the rapidity of its growth again depending on the nature and amount of the food it has taken.

There is but little difference between the skin of the parr and that of the small trout, but the following distinction between the two fish can be made by the fisherman. First, the tail of the parr will gradually assume the forked or lobed

PLATE XXVIIIA.

SCALE OF YOUNG SALMON SHOWING SEASONAL MARKINGS.

PLATE XXVIIIB.

SCALE OF 25½ LB. SPRING FISH, WYE.—HEN.
Denudation showing spawning visit, but the annular markings do not show the correct age of fish. See page 275.

appearance common to the salmon, while the anterior edge of the trout's tail will always present a straight edge when the tail is opened. Secondly, the adipose fin of the parr is always without pink colour, while the trout's adipose fin has always a more or less pink spot or colouring. It is not until the smolt stage of the parr approaches that a difference is first noticed in the appearance of the skin, when, either from a changing physiological condition in the young salmon, or from a greater absorption of the material elements of which the skeleton and exo-skeleton are built, fresh laminæ more rapidly succeed each other, and as each fresh addition is added to the young scale its superficial area is increased by the width of the latest formed band of scale material (see Plate XXVIIIa).

The scales thus expand, and become imbricated at their posterior ends. This overlapping does not stop the growth of this portion of the scale, however, for the ducts which must supply the material from which the scale is formed still continue their functions.

The scale, as it grows, now presents the appearance of a delicate silvery armour, which characterizes the advent of the smolt period, and so long as the smolt, grilse or salmon is healthy and in good condition, this silvery sheen will be retained by the exposed portion of its scales.

The brilliant opalescent glaze of the scale is transmitted by some iridescent pigment in the membranous covering, possibly of a calcareous nature, which, if examined under a magnifying glass, will recall the iridescent lustre often seen in the track of snails. The formation of the membranous covering of the scales, in which this brilliant sheen occurs, appears to arise from a mucous secretion issuing from a similar class of ducts to those which supply the material creating the shells of certain of the mollusc family.

The scales cover the body like the tiles on the roof of a house, and the markings on the exposed posterior portion of each scale may thus suffer. The markings on the anterior and greater portion of the scale surfaces are protected by the overlapping of those above them, and are only affected by physiological conditions such as those which take place as the genital changes occur. The change —during this period—in the character of the material of which the mucous covering of the scale is formed, may to a certain extent cause the breaking down of a portion of the structure of each scale.

Prior to spawning, the calcareous or other elements giving this brilliant iridescent sheen to a portion of the membranous covering of the scale, are possibly required to build up the ova of the fish, and as a consequence the appearance of the scales suffers, and this membranous covering loses its brilliancy and resiliency, becoming dull, heavy and coloured.

As the spawning condition of the salmon approaches, the constituents of the mucous matter appear to alter; though it does not seem to decrease in volume, it apparently becomes more slimy in character and envelops the scales more thickly—especially in the cock fish—and gradually merges them more or less into the epidermis.

Scale Growth

As the smolt passes into the grilse stage and then into that of the salmon, a series of laminæ are being continually added to the scales, the outer edges of which laminæ are formed presumably to protect the skin as the body of the fish increases in size and outgrows the covering afforded by the former growth of scale surface.

The posterior portions of each addition to the scale appear to grow with less rapidity than the anterior

portion, and thus, as the salmon grows, the nucleus gradually loses its central position in the scale, and tends to approach the posterior edge (see Plate XXX.).

It will also be noticed that the annular bands added to the scale are of varying numbers, and width, and if they are carefully examined it will be seen that the alternate occurrences of the wider and narrower bands form a series, and each complete series of such varying widths of these annular markings indicate the age as well as the annual increase in the size of the fish.

I consider the explanation generally given by modern writers as to the individually varying size of these additions to the scale of a salmon worth consideration.

It is said that the annual periods of decrease in the size of the scale bands is due to the limited food supply to be found during each winter in the sea. As we do not know where the salmon goes to during his summer and winter sea life, we cannot know whether or not his winter habitat is less happily provided with food material than his summer quarters, and therefore if some other reason will provide a more satisfactory explanation I think it is worth examination.

It has been proved that a salmon, if kept in fresh water, and isolated, will year by year, as the spawning season comes, develop the condition of a spawning salmon, will neglect its food, will suffer in appearance, etc., and we can safely assume that salmon in salt water, even if they do not visit the coast,* also develop certain of the genital changes associated with the creation of ova, as each spawning season approaches, *i.e.*, winter time, and it is not improbable that at such times, as with all other fish, their appetites

* It may be that most if not all the fish of each year's batch of smolts may visit our shores as shoals of grilse or young salmon, but that many members of each such shoal may either be unable to ascend, or not in a condition to wish to ascend, the river of their birth, and that these return to the sea until a more favourable opportunity.

decrease, and little or no food is taken by them. Their bodies do not increase in size to any considerable extent, and nature is therefore not called upon to make any very great increase in the size of the scales.

I cannot agree that the diminution of the annular markings can be considered as being due—as has been suggested—to disturbance of the salmon while on their feeding ground. It is far too regular in its occurrence and covers too long a period of each annual series.

Trout and their Scales

Trout will also develop their scales—but more slowly than the smolt—as they encounter or pass into waters containing (either as an element or a component part of its smaller inhabitants) an increasing quantity of lime salts. In the waters of New Zealand this exo-skeleton growth is very remarkable, the Brown Trout of the Southern Island especially developing similar scale markings to those on the scales of salmon. The large trout in that country, save during the spawning season, appear to reside and flourish best in the tidal waters of the rivers, but the exact extent of their visit to the sea, if any, has not yet been determined.

Trout of one year or two years' growth, on leaving the streams flowing into Loch Leven and entering its waters, develop their scales, which, like the smolt scales, gradually conceal their former markings (see Plate XXIX.).

When young the skin of the ordinary brown trout appears to the touch, and when scraped, to be as free from scales as the lamprey. In many of our chalk streams, especially in rivers like the lower part of the Test, where sub-aqueous foods of the water-shrimp variety are plentiful, the scales, as they grow, change very considerably the colouring and appearance of the trout from that by which it is known in the upper portions of its rivers. The scales can be detached

LOCH LEVEN TROUT—THE COCK AND HEN FISH.

from the trout of many of our rivers after the second year's growth.

The development of a line of scales forming a silver bar on the side of trout is an indication of its health and rapid growth, and is not uncommon on our chalk streams. Mr. Clinker, the Manager of the Lower Chilland Trout Hatchery, Hampshire, tells me that fish thus distinguished always do well in the spawning season. This, too, is quite what we expect, for the rather unusual growth of scales forming such a bar indicates that an abundance of the best food has been within reach of such trout.

Scale Markings

The edges of the laminæ forming the scales of a salmon indicate many of the most important events of its life—its age, its descent as a smolt to the sea, the varying amounts of its summer and winter growths, the physiological alterations in its appearance due to its ova-bearing condition, its first spawning visit to a river, its return to the sea, its recovery there, and the fact that it has made a second or even third recurrent visit to fresh waters on spawning intent.

It is also supposed that the decrepitation of a portion of the scale markings proves that a natural and successful act of spawning has taken place.

It is on this latter question that I venture to express a doubt. The marking on the scales indicates that, owing to genital changes, the condition of the salmon has altered, and that it has visited fresh water, but it does not prove that it has carried out its life's purpose and spawned in a successful and natural manner. This difference must be regarded as most important, for the salmon which has spawned successfully may well be considered as being among the vast majority of fish which perish annually, whilst those fish whose attempts to reach a spawning ground or

to find a mate have proved abortive, may with reason be most naturally expected to be among those which will be impelled to revisit the river, and whose marking will, therefore, show a second or even a third period of scale decrepitation.

It is rarely the case that a male fish is found in a fresh run condition in a river, showing on its scales the decrepitation marks of a former visit to fresh water. This means that the male fish is generally successful in the attempt to ascend a river, and once having achieved this—the object of its life—it seldom, if ever again, even if it survives, attempts a subsequent spawning visit.

In this fact probably lies the explanation of much that has hitherto been regarded a problematical, for it may be that the male fish, physically stronger, and physically less encumbered than the female fish, is able to attain the object of its life by reaching the spawning beds in the upper waters of its rivers ; whereas the *late-running* female fish, sexually more delicate in its construction and encumbered by its ova, is more liable to failure in its initial attempt, and consequently carries on its scales the evidence of this failure in the form of decrepitation marks.

The Physiological Changes in the Condition of Salmon

The alteration in the condition of the salmon is due in the first place to the physiological influences of the genital changes, and as a consequence, to the loss of nourishment owing to non-feeding, and to the change from salt water to tidal or fresh water.

These three causes physiologically alter the condition of the fish and its skin, and the scales which are held therein. Attendant on this altered condition the annular markings on the posterior portions of the scales may be entirely

obliterated up to the central axis of the scale, to a certain extent owing to the physiological changes which are associated with the act of spawning, but principally to the decrepitation which will occur to the exposed surfaces from the trituration of gravel, rocks, etc., while the lesser decrepitation which takes place in the markings situated on other parts of the scale—but chiefly in the lateral—can only be due to the changed physiological condition of the fish, and to the shrinking of its girth.

It is probable that the discoloration, if not the direct decrepitation of its scale material, is due to the absence of some element—possibly calcareous—from the mucous matter which forms and nourishes the scales.

Whatever may be the cause of its absence, the later formed laminæ of the scale material are the ones to suffer, more particularly in the lateral direction. I think we owe to Mr. Calderwood the suggestion that scales must suffer in the hen fish when the body shrinks as the ova of the fish is discharged. Now the fish cannot shrink in its length, but only in its girth, and the fact that the decrepitation principally occurs in the lateral substantiates Mr. Calderwood's theory.

The decrepitation of the male salmon's scales occurs at a relatively early date to that of the female fish, and consequently they become more marked by the end of the season; this is understandable when it is remembered the different effects which a spawning condition has on the male and female salmon.

There does not appear to be any unimpeachable evidence that the genital changes produce decrepitation of the scales, or even affect the appearance of the salmon while in the sea. The arousing of the spawning instincts causes the fish to approach our shores, but their appetites appear to be unaltered until they enter the estuaries, or as the winter

months approach; until then, the salmon may continue to feed while in the sea.

Discoloured Fish

The fact that discoloured salmon of both sexes are captured in the sea, does not prove that these fish have so altered while there. They hang about the estuaries, or in the mouths of the rivers—after their arrival in a clean condition from the sea—until an opportunity offers to run up to the spawning grounds.

A "fresh run salmon" if it means anything, means a fish fresh from the sea; a fish ascending from an estuary into a river, unless it has come direct from the sea should not be classed as a "fresh run salmon."

Salmon undoubtedly make their way up the tidal estuaries of our rivers, and some way into fresh water with each recurring tide, and descend again as the tide ebbs. This may happen daily until a favourable moment occurs for the run up the chosen river, but while they are awaiting the chance to ascend the river, their appearance and their condition undoubtedly alters.

It is far more natural to assume that the fish which are now considered to have become discoloured in the sea, are those which, after spending some months in the rivers or estuaries, have become discoloured there, and have from some impelling, because natural, reason descended to the sea and then lost their freedom in the nets.

Marked, unspawned fish will drop down to the sea, feed, acquire weight and return the same year.

Unspawned salmon have been captured in fresh water and marked, and have thereafter gone down to the sea, put on from one to two and a half pounds in weight, and after from thirty to forty days have elapsed, these fish have been recaptured.

It is a recognized fact that kelts, whether completely spent or partially spent, will remain as kelts for many months, and will as such, re-ascend their own or other rivers from three to five months after being marked.

I gather from a letter which appeared in the *Fishing Gazette* (pages 591-2, December 27th, 1913) that Mr. J. Arthur Hutton considers that the wearing or disintegration of the scales is not necessarily due to the act of spawning, nor to its continuation in fresh water, but that it can take place in the sea as well as in the river.

I am perfectly prepared to accept the view advanced by Mr. Hutton that disintegration of the scale of a hen fish may precede the act of spawning—but if it be so, how can such decrepitation be regarded as the sign manual of spawning.

That the scale of a male fish may become worn prior to spawning is a recognized fact, and from Mr. Hutton's dictum I have no doubt that, at any rate to a modified extent, decrepitation is shown on the scales of a female fish prior to its spawning.

In order that this popular point of view as stated by Mr. Hutton, cannot be misunderstood, I venture to quote from his letter mentioned above :

> "As regards the question put by your salmon-angling friend as to late autumn fish which rush into the river to spawn and back again, there is a paper of mine coming out shortly in the *Salmon and Trout Magazine* on this subject ; and as a matter of fact the wearing of the scale does not take place solely in fresh water, and fish do get, as some know, absolutely red and discoloured in the sea. In other words the wearing of the scales is not due to the fish being in fresh water but is largely caused by the building up of the genital organs. It will therefore be evident that a late run fish might have scales as disintegrated as one that had entered the river much earlier."

I think Mr. Hutton is relying on the experience he has gained by the investigation of salmon caught in the Wye and its estuary, which latter ends as it enters the estuary of the Severn. I do not think that every salmon captured outside the estuary of the Wye, can be definitely proved to be Wye salmon, as both Severn and Usk fish are to be found anywhere between Beachley and the New Passage. Even if all the fish captured in this water were fish on their way to the Wye estuary, they can only be considered as being estuary fish. This suggestion may tend to modify the views that fish can become discoloured and exhibit spawning marks in the sea before entering the waters of our estuaries.

The Estuary of the Severn

The estuary of the Severn can hardly be regarded as the sea. A line drawn from Portishead across to Llandaff can, however, be considered as enclosing to the east the estuary of the Severn, into which, besides the Severn, are emptied the waters of the Wye, the Avon, the Usk, etc., while salmon rivers, such as the Taff, the Towey, the Parret, the Tawe, etc., contribute a certain proportion of their salmon to this estuary. No fish caught in the nets to the east of this line can, with certainty, be regarded as being more than estuary fish, *i.e.*, fish which *may* have been some time in the estuary, or as having, perhaps, been in the lower portion of any of the above mentioned rivers. When therefore, they are caught above this line, and found to be discoloured, I think it may be regarded as probable that this discoloration has taken place either in the main estuary or in some part of the above mentioned rivers. Anyhow, being caught in this estuary, does not prove that they have come straight in from the sea—unless they are in an absolutely fresh run condition and bright and silvery in appearance.

It is a known fact that in the Tay estuary, salmon hang about the sand banks and gradually become discoloured long before they attempt to ascend the river, but no one calls the estuary, in which they stay, the sea. Data, therefore, as to the condition of salmon captured in the estuaries of our rivers, is of no particular value as proving what their condition was when leaving the sea.

The Wye

From an intimate knowledge of the Wye I should infer that of all rivers it is the most unreliable one from which to draw general deductions—at least so far as regards the fish captured below Tintern. This river differs from others in that it not only has a tidal estuary of its own, but that this again enters a much larger estuary, into which latter estuary other salmon rivers empty themselves.

In the case of the Wye, the fish captured below Tintern, even if they are not fish which have tried to run up the Towey, the Tawe, the Taff, the Usk, and gradually approached and run up the estuary of the Severn, until they reached the mouth of the Wye, might well have attained a discoloured or advanced spawning condition in the Severn estuary itself, in which they may have been lingering for some time since leaving the sea.

Icelandic Rivers

Icelandic rivers, for the reverse reason, may be regarded as supplying much sounder data as to the condition of fish fresh from salt water, and it is therefore advisable to note the evidence on this point by Dr. Dahl. He says, in his report on the Icelandic Salmon (1913), which report is based upon the scales taken from fish caught in or at the mouth of the Ellidaa, Hvita, Olfusa, and the Haffjordara Rivers :—

> " When the salmon comes from the sea, its scales are quite unaffected (only one exception is mentioned) but the longer it remains in the river, the more do its scales become affected."

Can anything be more directly opposed to the theory that decrepitation and discoloration takes place in the sea, prior to a fish entering an estuary or river on its spawning journey up stream?

The fact that the material examined by Dr. Dahl consisted of nearly 3,500 fish, gives great weight to any opinion expressed by him.

A consideration of the entrance of the Icelandic rivers above mentioned, on the one hand, and rivers such as the Wye and the Tay on the other, show that the value of the Icelandic deductions *on that particular point* should be considered as important, while the value of such investigation, when based on the fish caught in the Wye estuary, the estuary of the Severn, or indeed in the upper portion of the Bristol Channel, cannot be so considered. In the case of the Wye and Tay, their estuaries, or the estuaries into which their waters run, are of very considerable length, and are besides fed by other salmon rivers, and in these respects they are totally different from the Icelandic rivers mentioned, which have either no estuaries or very small ones, and flow almost directly into the sea.

One of the reasons which are given as evidence that fish become discoloured, etc., in the sea, is that later in the season fresh run fish, discoloured fish and discoloured fish with sea lice on them, are found running up the river together.

This is only of importance when it is noticed in the lower reaches of the river, and when it is evident that all these three classes of fish must have come either from the estuary of the river or direct from the sea, but it is no evidence that the discoloured ones have acquired their colour while in the

sea. Fish become discoloured in the estuary and while waiting for a chance to run up stream. They become discoloured when they have run up stream, and from whence they often drop back to the estuary or to the sea itself, and both the discoloured fish which have dropped back to the estuary water or to the sea, and those which have acquired their discoloration only in the estuary water will take the first, and very often the same opportunity of running up their river as will the fresh run fish coming in directly from the sea.

I am afraid that it really comes to this—that a salmon, however little it may be discoloured when taken on a coast line, or even at some distance from fresh water, cannot clear itself from the suspicion of having previously been philandering up some of the adjacent rivers, and of having become discoloured in these waters.

In addition to scale evidence, the ventral organs—the porus genitalis—will within a certain period, after the ova has been shed, bear evidence as to the shedding, but not as to the circumstances connected with the occurrence.

Scale markings will undoubtedly be more or less defined in proportion to the time the fish has been in fresh water, and therefore it is not likely that any two salmon would exhibit the same amount of decrepitation.

Decrepitation will, to a very great extent, occur after spawning—or the passing of the ova—has actually taken place, as the fish certainly do not perish at once, and subsequently frequently exist for some time in the river, in a weak and emaciated condition ; therefore the decrepitation of their scales would naturally still be going on.

This important fact cannot be disproved, but unfortunately it again weakens the contention of those who maintain that there is a distinct spawning mark always recognizable on fish which have spawned—and by spawning

I mean fish which have spawned under natural and favourable circumstances—for the decrepitation is undoubtedly due, in the latter case, not to the act of spawning, but to the condition of the fish after spawning, and would be equally noticeable on a fish whose ova had been passed under less favourable circumstances.

When discussing the question with Mr. C. Tate Regan, M.A., of the British Museum, Cromwell Road,* he pointed out that my theories led to an issue which precluded any definite knowledge being arrived at from scale records as to whether a salmon had ever legitimately spawned, and therefore it might be argued that a fish had never spawned. I had to acknowledge that this was exactly the point at which I had arrived, and that I considered that the scale markings only prove that the salmon has left salt water and has developed and discharged its ova, and were it not for the fact that we see salmon spawning, the scales would do nothing more than confirm the opinion that the salmon had in some manner vented its spawn ; thus leaving us unable —without further proof of this fact—to determine the difference between a salmon that has achieved its life's purpose, and one which has failed to do so ; and until this point is settled, the lately developed school of research on scale marking is unfortunately prevented from basing its deductions on an exact science.

A migratory bird, whose eggs or young brood are destroyed, may nest and breed again the same year, but if the bird has once successfully reared its young, it has not been proved to have nested again during the same season. Salmon are a much lower order in the ranks of the migratory vertebrates, and their life's duties probably cease when they have deposited their eggs in the act of spawning. If prevented from carrying out this duty, they may be

* Author of *British Fresh Water Fish.*

expected in any after season to again attempt to carry out their life's work. If salmon were intended for a recurrent act of spawning, I take it that in those rivers easy of access such as the Wye, more so-called double and treble spawners would be taken. But it will be found that it is on the scales of the salmon belonging to the rivers which are the most difficult to ascend that the greater number of the so-called spawning marks will found to be recurrent. (See Mr. Menzie's report on the Add Salmon, see p. 275-276.)

The Respective Influences of Salt and Fresh Water on Salmon

At no time in its life is the salmon in such good condition as during its sojourn in salt water, but this condition begins to alter directly it enters the estuary or the waters of the river up which it wishes to run, and the longer its stay there the greater will be the attendant change in its appearance. It neither feeds nor grows, neither retains nor recovers its best condition while in fresh water. It is not in every river that any number of so-called well mended kelts are to be found.

If it were possible for salmon to remain in fresh water, their scales would possibly lose their resiliency, and, becoming more pliable, would be absorbed in the epidermis, and the colouring of the fish would gradually assume characteristic markings such as those which are common to the skin of fish like the Ouananiche,* the Huchen, etc.

The bodies of salmon parr and trout are wanting in calcareous substance, more so perhaps than any other forms of the teleostei, and it is not until the salmon reaches the sea that Nature provides calcareous matter in sufficient

* This fish is supposed to be descended from land-locked salmon, but it has not yet been proved that a true salmon will continue to breed if prevented from visiting salt water. Like the Huchen of Eastern Europe, it is possible that these fish are descendants of a hybrid between a salmon and some other fish. It has been proved that certain of the hybrids of salmon can live, flourish and breed without a visit to salt water.

quantities for its full development. In the abundant larder at its disposal in the salt water the crustacean figures largely, and there can be no doubt that it is from such food that its body as well as its skeleton, is increased so prodigiously.*

The Question

Is it the salmon which has successfully spawned once, regained its condition, and developed a fresh batch of ova, that is once again able to spawn ?—or is it only the salmon that has failed in its attempts to spawn in a natural manner, which re-attempts in some following season, with a new batch of ova, the difficult and dangerous ascent to the spawning ground ?

At present the signs of irregular decrepitation having destroyed a certain number of the concentric markings on the former edge of a scale, are considered by some of the men to whom we owe most of our present knowledge, to indicate that the salmon to which the scale belonged has spawned. While fully recognizing the great value of their patient investigations in this new study, as I said before, I yet venture to think that such data fails to prove more than the fact that the salmon has undergone genital changes, entered fresh water, and approached a spawning condition, but not that it has found a mate, and spawned under favourable circumstances.

The importance of determining this question must be evident if scale reading is to form an exact datum on which

* Calcium salts, *i.e.*, lime salts, form a not inconsiderable portion of the scales of a salmon. Miss Esdaile, who has devoted so much time to this subject, has been kind enough to criticise some portion of this chapter, and still further added to her kindness by writing to the author, on the 9th February, 1914, as follows :—

> "When the calcium has been removed the scale appears to be unchanged in shape and size, its markings are still clearly visible, and the unevenness of the surface of the scale is still to be felt."

This indicates that while scale matter is composed partly of lime salts, other materials go to form the base of its structure.

to base further deductive analysis, not only with regard to the distinction of biological types of salmon, but as to the life history of any member of any one such type.

To deposit its eggs, when, and as a result of, being sexually excited, can be the only correct meaning of the word spawning, but to expel, or discharge its ova under any other circumstances cannot be so considered.

It has been claimed that a salmon in captivity has been twice artificially spawned. Even if this be so, it does not prove that such a fish would have spawned even once naturally. It only proves that ova can be developed and shed, and a spawning condition again arrived at, with which probability I quite agree.*

No individual male or female salmon has been seen to spawn in a natural manner, has been then captured and marked, and found to revisit the spawning beds and again spawn, and until such a definite and decisive proof is

* Since the above was written I have received a very interesting letter from Mr. Hutcheon, Manager of the Tugnet Hatchery, in answer to enquiries from myself—as follows :—

"Dear Sir,—The salmon which you refer to was kept in the rearing ponds, and was a male fish. He was two feet long and weighed four-and-a-half pounds when at his best. He spawned twice to my knowledge, and might have done so a third time, as I have seen milt running from parr two years old. During the time I had him, he began to change his colour about the months of August and September, and got very dark red about the months of March and April. He again changed his colour and got quite clear, as bright as though he had come from the sea.

"I had another fish—a female—which I kept five years. When she was three years old, I took the ova from her in the month of January, but as I had not a male fish at the time it was lost. Next season I spawned her and impregnated the ova with a male fish of forty pounds, laid the ova in the hatchery, and it hatched out all right, the only difference being that the ova was white instead of red.

"During the alevin stage there was no difference from the rest alongside them in the rearing ponds. I took them down to the hatchery and fed them, when they were turned out into the river."

The above letter is important, for it proves that a male fish will vent its milt when unaccompanied by a hen fish, and that this condition is even noticed in the parr before it has visited salt water.

With regard to the hen fish, this corroborates the other well-known incident which occurred I think at Plymouth, but in neither case do these instances prove that either a male or a hen fish will spawn naturally, and from sexual inducement, on more than one occasion.

produced, the question—so far as the so-called spawning marks are concerned—must remain unsettled. Many salmon are captured, whose appearance proves that their ova has been matured and then discharged, and a few of these marked fish have been subsequently recaptured on their way up stream in a spawning condition, but the fact that its ova has been discharged does not prove by any means that the natural act of spawning has taken place.

Salmon meet with tremendous difficulties in their endeavour to reach the spawning grounds to which their instincts compel them, and should they fail, as they so often do, I think it not improbable that the true spawning of the fish may be prevented, that probably discharge or possibly absorption of the ova or milt takes place, and that a further attempt to spawn will naturally be made by the fish in the next or some following season.

It is stated that salmon have been seen to discharge their ova immediately after entering fresh water, but the conditions and circumstances of their life preceding this act are unknown. They may of course be late run fish, which have been unable to reach their river until fully ripe, and unable any longer to carry their ova; or they may have been in fresh water for many months prior to such an action and been compelled to descend to the sea, and have re-entered the river when in a condition ripe for spawning, but being too late to run up, and unable any longer to hold their ova, they have vented it. It may be safely assumed that in most of such cases, the discharge of the ova is unavoidable, the fish being unable to carry its eggs any longer. It may be probable that the attendant actions are purely instinctive, and that in many cases the ova will be simply discharged without any attempt being made to construct a redd or to find a mate, and there can be little

doubt but that many such discharges occur in the deeper parts of the river beyond the ken of man.

The Ova of Salmon

The ova of the salmon is developed in capsules in its ovary, and when mature these capsules rupture and drop the ova in a more or less adhesive and uniform mass into the abdominal cavity (not, of course, into the stomach or any part of the alimentary channels). From there the ova, when ripe, passes through two short oviducts and is vented by the porus genitalis, situated between the anus and renal apertures. Should the ova not be discharged in the natural act of spawning, it is probable that after a period of retention it will eventually pass away through the oviducts and thence by the porus genitalis, and for a time leave recognizable evidence of a passage of ova such as that which takes place in spawning.

It is not impossible that "rawners" may be classed as being in this latter condition, and that the compact form in which their ova has been held is broken up and the ova subsequently vented.

Mr. Hutton and the Spawning Mark

I think that everyone admits the care and attention which Mr. Hutton has given to the question of the examination of salmon scales, and that we all owe him thanks for the work he has done, but as I go to press, I notice in the latest number of the *Fishing Gazette*, December 27th, 1913, he says, in a letter on page 592 :—

> "The Salmon and Trout Association are publishing a paper dealing with the question in their December Magazine, which I think will prove that no matter how late a fish may be in entering a river to propagate its species, and no matter how short a time it may

> remain in fresh water, an indelible 'spawning mark' is certain to be imprinted on its scales."*

Mr. Hutton claims that the spawning marks are shown on the scales of a salmon, no matter how late the fish enters a river, or how short a time it may remain in fresh water before spawning. If then a salmon ripe for spawning were captured in the estuary of a river before it had spawned, it would carry markings on its scales, which would prove, according to Mr. Hutton, that it had already spawned.

Evidently some other physiological evidence, or some more practical proof, must be adduced before it can be accepted that such markings are sufficient to certify that such a fish has spawned.

Again, if, instead of being captured or killed, it was wounded in such a manner as not only to prevent its spawning, but to force its return to salt water, such a fish, if it eventually recovered, would bear these spawning marks, and whatever might have been the after-fate of the ova it had failed to spawn, it would—impelled by its instinct—probably return at a future season to spawn, and thereon, if captured, would be considered to be a fish spawning for the second time.

Notwithstanding the attention which has been given to this subject, I am inclined to think that this problem is one which has not so far been definitely solved. As Mr. Malloch says :—

> " Anglers are often in doubt as to whether the fish they have caught are clean or not (*i.e.*, have spawned or not), and this is not to be wondered at, as those who are constantly among them sometimes make mistakes when judging from outward appearance only."

* This opinion is, however, opposed to that of Dr. Masterman, who says, " that a large number of grilse which enter a river late in the season become kelts, but do not become labelled with a definite spawning mark.

The Varying Number of Rings on a Scale

The consideration of this subject would not be complete without a reference to the varying numbers of the annular markings which occur on the scales of a salmon during each summer and winter sojourn in salt water, and also as to the number of bands added to the scale after each series of so-called "spawning marks."

It has been suggested by Mr. Malloch, that the number of annular rings added to a salmon scale for each year of its life is sixteen. This estimate seems approximately borne out by the scales put forward as evidence by Mr. Malloch in his excellently illustrated book "The Life History and Habits of the Salmon."

But while any such particular estimate might perhaps be true as regards the salmon of any one river, or indeed of any one district, yet from the scales I have examined I feel assured that such a thing cannot be accepted as having a general application.

This however is certain, that when once decrepitations have destroyed the smooth and characteristic edges of the scale of a virgin fish, it will be impossible to estimate how many of such concentric markings have been destroyed. Further, it will be impossible for a correct estimate of the exact number of months which a salmon has spent in salt water between any two succeeding conditions of spawning to be made from scale markings—that is, when once the second series of decrepitations have been effected—for it will here again be impossible to tell how many or how few of the latest added concentric markings have been obliterated.

The number of rings which are seen between the two series of so-called "spawning marks" in Plate XXX., does not definitely indicate the proportion of time which was spent in salt water between the spawning seasons, because we

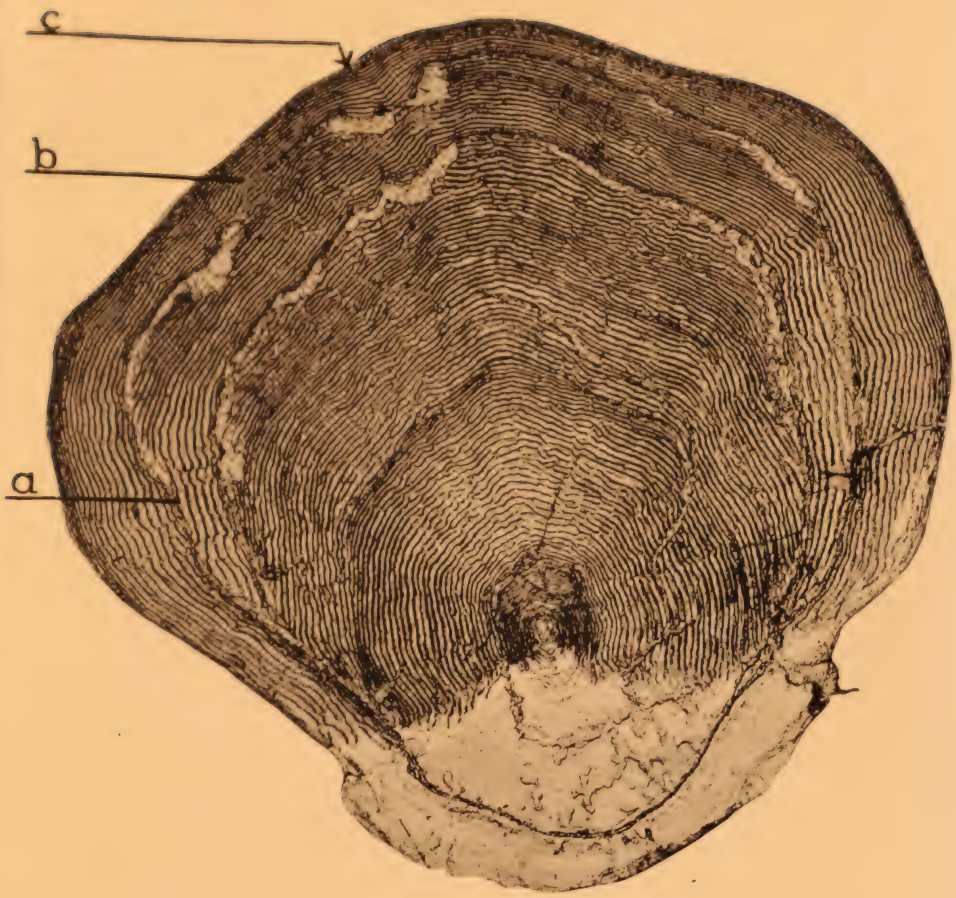
cannot calculate how many of these rings have been destroyed during the last decrepitations.

At A in this plate it appears that only five such rings had been added, but at B we can see, if we follow the rings round the scale, that at least twelve others must have been built on the outside ring of this series of five, and that therefore twelve such rings must have been denuded beyond the outer of the five rings at A by decrepitations. In certain scales where the decrepitation on the outer rings has been excessive and irregular, the new markings which are added to the scale as the salmon recovers its condition are no longer concentric to the former annular markings, or to the nucleus ; they at first appear to fill up the deeper decrepitation, and then to be continued as annular bands concentric to one another, and roughly speaking, to the centre portion of the scale. See C., Plate XXX.

As I have already suggested, the scales are added to only in reply to the requirements of nature.

The varying number of rings which are formed between the decrepitation of any one season, and between either a recurrent visit on spawning intent, or between a subsequent decrepitation, must frequently preclude any definite conclusion being formed, other than that Nature will create just as many rings and of just so great a width as is necessary to cover and protect the uncovered area of the skin as condition is regained and additional growth attained.

Referring again to Plate XXX., the decrepitations on this scale at A clearly establish the fact that the salmon had reached a spawning condition, and had probably been for some time in fresh water. Assuming then that this salmon had spawned, or otherwise discharged its ova for the first time in January or February of any year, and that it had descended to the sea in April or May, had recovered, and had, as shown by the decrepitation, again spawned or discharged



A 34 LB. HEN SPRING FISH, NORWAY, MAY 21ST, 1909.

At A it shows 5 annular rings added after its first spawning visit, other and outer rings having possibly been denuded away.

At B it shows 17 or 18 additional rings added for the same period.

At C it shows the irregular manner in which the annular additions are added to the scales.

The sixteen ring theory seems to be contradicted by this scale.

The smooth outside edge of a fresh run fish is well shown. This scale also shows the irregular character of denudation, which accompanies and follows a spawning visit.

Photographed and enlarged by Mr. J. Arthur Hutton.

its ova during the following spawning season, then only a relative proportion of the assumed sixteen fresh annual markings could possibly have occurred. But if we count the number of rings at B, we shall find no less than sixteen have been added, though the salmon cannot possibly have been in the sea more than eight months, and therefore the theory of sixteen rings is not applicable in this case. The salmon cannot have spawned in January, reached the sea in April, run up in time to spawn again in the winter, and have spent more than eight months in the sea. Yet inadequate as this time may seem, Nature is a very rapid architect, and there is no other probable deduction to be drawn from this scale if its markings are to be relied on, other than that the fish has discharged its ova twice in twelve months, some four months of which must have been spent in fresh water.

The irregular manner in which these decrepitations eat up or destroy the concentric markings will be noticed in the scales shown on Plate XXX.

The scale shown in Plate XXXI.—kindly sent to me by Mr. Hutton—is in my opinion most instructive. Mr. Hutton has marked on the photo that it is "a hen spring fish of thirty-four pounds weight, caught on April 26th, 1909," and that "it has spawned once." To me it appears that the date of this first spawning condition, or the passing of its ova, must have been at least fourteen or fifteen months prior to the date of its being killed. The size and number of the new concentric markings show that they cannot have been added to the scales since the more recent spawning season, and their growth has been strictly in proportion to the increasing bulk of the fish.

This scale also shows that the salmon's condition was perfect at the time it was captured, for no decrepitation has yet taken place in the outer edge of the scale which is smooth

and rounded, and also we may assume from this fact that probably this fish has but recently entered the river. It shows that had this fish not been captured it would have spawned or attempted to spawn in the following season, *i.e.*, winter of the year in which it was captured. It also shows that the bands added to the scale after decrepitation has occurred do not invariably show a falling off in size during the winter season but that even on the same scale their size, as well as their number, varies considerably during this period.

AN EXAMINATION OF A SALMON'S SCALE, PLATE XXXI.

Taking the scale at A, we find that the bands added since the last decrepitations are evenly graduated in size—the large bands for the feeding and the smaller ones for the fasting period, and also that they are in number approaching the sixteen-ring theory.

Taking the same scale at B, we find the same number of rings, but all small and of a similar size.

Taking the same scale at C, we find about sixteen additional rings, but very little evidence of a cessation of feeding.

Taking the scale at D, we find ten such rings at the most, and no evidence of cessation of feeding until we reach the extreme edge.

Taking the scale at E, we find ten rings have been added, all of them being about equal in size.

These variations in the number at least of the added scale bands, cannot be due to decrepitation, for the smooth outer edge of the scale shows that no denudation has taken place.

Again, if the reader will count the markings between the third and fourth year, he will see that, instead of sixteen rings, over thirty rings have been added, though between them and the time the fish became a kelt there are only

A 34 LB. WYE SALMON—HEN FISH—APRIL 26TH, 1909.

This scale shows how variable in size and number are the annular rings added to the scale, after decrepitation has occurred.

(a) about 16 rings graduated in size.
(b) about the same number, all small.
(c) about 18 large and small rings.
(d) about 9 large rings.
(e) ten large rings have been added.

The scale at the period of its third year appears to have been decrepitated at its anterior edge. Mark the large size of the bands which have followed.

Photographed and marked to the right by Mr. J. Arthur Hutton.
Magnified about 12½ diameters.

eighteen fresh rings to be counted. As no one, however, can possibly tell how many rings were lost during the first decrepitation, the exact age of the salmon is indeterminate.

Mr. Hutton notes on this photo that the decrepitation at "kelt" marks the fifth and sixth years of this salmon's life, and, appreciating his exhaustive examination of this subject, I should be inclined to believe in his estimate, but the scale markings cannot be said to prove this.

The decrepitations have effaced two thirds of all the annular rings of the scale beyond the fourth year's markings, and if the remaining third portion of these rings had been also obliterated, there would have been no indication beyond the size and weight of the fish to indicate the fifth and sixth year of the salmon's life, and the scale would have appeared somewhat as the scale shown in Plate XXVIIIb.

If this scale is examined it appears to have belonged to a fish which has had its scales decrepitated by previous spawning conditions in its fourth year, and that it is again running up in an attempt to reach the spawning grounds; but from its weight and the appearance of the scales it may well be a five-year-old fish, *i.e.*, a fish which has spent three years in the sea, whose fifth year's annular markings have been entirely lost through decrepitation, just as the others have been over two-thirds of their extent on Plate XXXI.

From this scale, and from many others I have examined, it appears to me that at any time after the outside edge of the rings of a virgin fish have been destroyed, a considerable uncertainty must exist in correctly determining the later history of the fish.

The Scales of Salmon from the River Add

A paper published in 1913 by the Fishery Board for Scotland, entitled "The Scales of Salmon of the River Add," by Mr. W. J. M. Menzies, has been referred to by several writers as an "extremely interesting paper."

I quite agree with these writers that the paper is extremely interesting, but only as showing the remarkable difference which exists between data taken from two different salmon rivers in Great Britain, and not as proving that salmon spawn more than once in their lifetime.

From the scales of eighty-five kelts taken from the River Add in 1912 and 1913, and supplied by Mr. Calderwood to Mr. Menzies, the latter gentleman reports that :—

> " Of the 1913 catch no less than 52½ per cent. were on their second or subsequent return."

As these fish were kelts, this is taken by Mr. Menzies to show that these fish had spawned twice. Mr. Menzies goes on :—

> " Of the twenty-eight fish of which this can be said . . . three of these were in fresh water for the purpose of propagating their species for the third time, while the scales of two others show three spawning marks, and as they were kelts when caught, these two fish, weighing 10¼ and 11 lbs. respectively, had spawned four times and still survive, after thus aiding in a most material way and to a hitherto unsuspected extent the continuance of their race."

Briefly this report of Mr. Menzies claims that from the scales of some fifty-five kelts netted in the river Add during the spring months of 1913, and examined by him,

28 kelts had spawned twice,
3 ,, ,, ,, three times,
2 ,, ,, ,, four times.

Mr. Hutton has, I believe, examined the scales taken from some 4,000 Wye salmon, and of these he claims that

nearly 300 had spawned twice, and
1 ,, ,, three times ;

so that while 52½ per cent. of the Add kelts had spawned twice, according to Mr. Menzies, only 7½ per cent. of the Wye salmon, according to Mr. Hutton, had already spawned

before, and, if they had not been captured, would have spawned for the second time.

But the difference is still more remarkable when we come to compare the relative proportion of the fish which are said to have spawned three or more times.

Mr. Menzies finds that out of these fifty-five kelt salmon caught in the Add in 1913, five had spawned three times.

Mr. Hutton, however, can only claim one out of the 4,000 or more Wye salmon whose scales he has examined, as having spawned three times, so that the relative proportion of fish said to have spawned three times in the Add and in the Wye respectively, are as 1 to 363.

From this it must be evident that if Mr. Menzies had examined the scales of 4,000 kelt fish from the Add, he would, if his report can be said to represent the normal yearly condition of the spawning fish in the Add, have been able to report the discovery of no less than 363 fish who had spawned three times at least.

The Add and the Wye

This shows the vast difference which exists between the salmon in the Add and Wye Rivers. It is of importance to remember, that while the scales examined by Mr. Menzies were taken from kelts, those used as data by Mr. Hutton were taken from both clean and unclean fish.

The differences between the Rivers Wye and Add are as follows :—The Wye is one of the longest rivers in Great Britain, and it is one of the easiest for a salmon to ascend in order to reach its spawning beds, whereas the Add is one of the shortest rivers in Great Britain, and, with the exception of the lower water, in which I believe salmon do not spawn, it is one of the most difficult rivers to ascend. Again, the Wye is a river up which salmon may run every month in the year, whereas the Add is one in which the run of

fish does not begin until July, the rod fishing coming to an end at the end of October.

Mr. Gathorne-Hardy

Referring to the Hon. A. E. Gathorne-Hardy's charming and interesting contribution, "The Salmon," to the very excellent series, "Fur, Feather, and Fin" (Longmans & Co.), this gentleman says with reference to the River Add:—

> "The little river that I know best, having fished it regularly for the best part of a quarter of a century, is the Add, which rises in the hills near Loch Fyne, and, after a short but rapid course through gorges and over rocks, descends into the plain, and for the last few miles of its career meanders slowly through the partially reclaimed peat moss which fills the valley opposite Crinan Bay, into which it ultimately discharges its waters close to the western outlet of the Crinan Canal. The lower part of the river winds round and round through the soft soil, the curves being so sharp that a straight line of about a quarter of a mile in length would cross the river three times. The stream has cut itself a deep channel through the peat, and the banks are high above the water, protecting it from the wind, which, as the current is naturally sluggish, is very necessary for successful fishing, except immediately after a heavy flood. The river, like all small West Highland streams, rises and falls with extreme rapidity, and the upper part of the water is only really in order for one day after a flood, and the lower for two—the first day being usually the best."

From Mr. Gathorne-Hardy's description, it will be seen that this river may be divided into two portions, the lower part being sluggish and therefore unsuitable for spawning beds, and the upper part offering extreme difficulties to ascending salmon.

No information is given in Mr. Menzies' report as to the part of the river in which the fifty-five salmon were caught in 1913, but we may assume they were taken at the mouth of the river. There is absolutely no evidence that a single one of these fish had ever spawned in a natural manner, that is during sexual excitement, and there is not even any evidence that any one of them had ascended the more rapid portion of the river to their spawning beds, and though we know that every season some salmon must be successful in ascending and spawning, there is no evidence to prove that any of them were among those whose scales were examined by Mr. Menzies, *i.e.*, that any of those which were successful survived the act of spawning.

In answer to a question of mine, Mr. Gathorne-Hardy has been kind enough to supplement the extract just given as follows :—

> " But I know that the fish run up to the rapids at the top, and to the tributary, to spawn, and that they ascend during a spate. They do not spawn in the sluggish part."

Such a report, however, as that made by Mr. Menzies, tends to confirm the supposition that salmon repeat the operation of spawning, and is used for this purpose by those who believe that salmon spawn two or three times.

There has not been, so far as I can gather up to the present, any definite and conclusive proof that salmon do spawn more than once, and until such evidence is produced, I consider it safer to believe that the repetition of these so-called " spawning marks " found more or less on the scales of salmon will depend to a considerable extent on the characteristics of the rivers themselves, and that where the river partakes of the nature of the Add the spawning marks will be found to be frequently recurrent. My reasons for thinking this are as follows :—

In the case of the Add there will be a far greater percentage of fish which will find it impossible to ascend to the spawning grounds—than on the Wye for instance—and they will hang about in the sluggish parts of the river, discolouration and decrepitation going on during this stay, and finally, if unable to ascend the river to spawn, will discharge their ova and return to the sea; some of them, such as those from which the scales were taken in Mr. Menzies' report, being captured in the nets, presumably at the mouth of the river. These fish, with their instincts to spawn unsatisfied, will in the following season again seek this river, and so on until they have spawned satisfactorily, adding with each visit the decrepitation marks which are now considered to represent the act of spawning.

The River Awe

In another report:—"Fishery Board for Scotland, Salmon Fisheries, 1911, No. 1," Mr. W. J. M. Menzies, after examining the scales of 258 summer fish sent to him by Mr. Calderwood, gives the following table:—

District.	No. examined.	No. with one spawning mark.	Percentage.
Spey	106	6	5.6
Forth	97	8	8
Awe	45	13	29
Kyle of Sutherland ..	6	0	0
Solway	4	0	0
	258	27	10.46

None have more than one spawning mark.

and goes on:—

> "Whilst the figures of the Spey and Forth confirm the results hitherto obtained in these and certain other rivers in Scotland, those of the Awe show a very much greater percentage of fish that have previously spawned."

The remarkable number of fish with a previous so-called "spawning mark" coming from the Awe, led me to believe that similar characteristics to those of the river Add would be found to exist in the river Awe, but not knowing the latter I wrote to Mr. H. T. Sheringham, the Editor of the *Field*, as to its nature. He was kind enough in reply to inform me that the Awe is one of the roughest rivers in Scotland. This information, as I anticipated, lends additional weight to my arguments; for it shows that in those rivers which salmon have great difficulty in ascending, such as the Add and the Awe, a very much larger proportion of the salmon will be found with the marks which are believed by a great many people to denote a previous act of spawning.

Now it must be evident that if a recurrent act of spawning does take place, it would occur most often in those rivers, the ascent of which is most easy, whereas it will be seen by these figures that exactly the opposite condition of affairs takes place.

On the same report is appended a note from Mr. Calderwood, who has examined the scales of twenty-five spring salmon, *i.e.*, from the Awe, of which four had spawned previously, three of these being fresh run fish, and the others kelts, the percentage of the total of these twenty-five fish which carried a spawning mark thus being about twenty-five per cent., while the percentage of the kelts carrying a spawning mark is about 4.5.

Synopsis

From the foregoing matter it will be recognized that I by no means infer that Nature does not reproduce ova in a female and milt in a male salmon, but I see no evidence which proves that the instincts of a salmon prompt it to spawn again after having once spawned under favourable circumstances and in a natural manner.

It will not be amiss to recapitulate some of the evidence on which these opinions are based, *viz.* :—

Salmon reared in tanks and artificially spawned do not show the so-called " spawning marks."

Milt may be noticed running from two years old male parr.

Fish are caught in the nets during March, April, and May, which are known as " half spent " fish. They are discoloured, and their scales show the so-called " spawning marks." The general explanation given for this condition of these fish is that the spawning operations have been interfered with by frost, ice, etc., etc. While such an interference might occur especially in the upper and more shallow portions of a river, innumerable other spawning grounds would be encountered by the mating fish during their down stream progress, and there would be many opportunities for a resumption of the spawning efforts by a pair of salmon after being thus disturbed, before they reach the nets. It is much more natural to suppose that the majority, if not all, of these half-spent fish are ones, which, not being able to reach the spawning beds, or to find a mate, have begun to discharge the ova with which they were cumbered, and that this process was still going on when they were taken in the nets; that these fish would all be found with the so-called "spawning marks," and on a return visit would therefore be treated as fish which had previously spawned.

Many spent fish, when migrating from river to sea, are quite clear (*i.e.*, not discoloured), and only to be distinguished from clean fish by their lanky appearance. These fish are probably salmon late run, which have discharged their ova shortly after leaving the sea, and been captured before a discoloured condition has occurred.

Dr. Masterman states that a large number of grilse which enter the river late in the season become kelts, but do not become labelled with a definite spawning mark.

Spawned fish without discoloration are caught in the nets, as they descend to the sea, up to May. Unspawned, but discoloured and emaciated fish, with ova not fully developed, are caught with the kelts, which are descending in the spring. These fish also exhibit decrepitation marks on their scales.

Salmon die in very great quantities, and it is doubtful if one salmon in every fifty, which dies after spawning, is recorded or even seen, as they are carried downstream to the sea on the winter and spring floods.

Injured and unspawned fish with the scale marks and having all the appearance of a stay in fresh water, are captured both in the *fixed* and drag nets, but it can be assumed that these fish are on their way to effect recovery in the sea. Many persons question the belief that salmon when injured return to the sea.

Mr. Calderwood, kindly answering some questions by the author, says in a letter, 22nd December, 1913 :—

> "A female salmon which has not found a mate, even a trout, and has not therefore shed her eggs, remains in fresh water for a considerable time."

And Mr. Calderwood further considers it likely that many of the ova will be shed, and that the remainder will be absorbed, but, as he says, "this is a supposition." The supposition is in this case of course the absorption of the ova. It is quite natural to infer that many fish return to the sea as spent fish, without having spawned in a natural and satisfactory manner.

Professor Sidney J. Hickson, of Manchester University, can see no reason "why the two oviducts should not pass the separated ova after disintegration as well as in the natural way," that is to say, shed the ova if spawning does not occur.

Many netters report the capture of half spent and discoloured fish in their nets during April and May, and

therefore I consider a large number of salmon find their way to the sea carrying the so-called " spawning marks " on their scales, but which have not yet spawned, and who will, if they survive, imbued with the strongest of all their instincts—that of the reproduction of their species—probably revisit their river in the following season.

So-called " well-mended kelts " are found in a river after the spawning season, yet we have no positive evidence as to what these fish are, or what has really happened to them. If they are late run fish which have spawned, or otherwise passed their ova, their clean appearance will not of necessity be due to recovery, but will most probably be due to the fact that little decrepitation and little outward alteration has taken place in the scales or to the fish through the physiological changes of spawning during the short time they have been in fresh water. Owing to the colder and healthier conditions of river water in the winter months, a late run fish would possibly show less signs of deterioration of condition for each month of its stay in fresh water than a salmon which had entered the river as a summer fish and encountered the more relaxing and less healthy condition of the river during the summer months.

Many observers agree that it is difficult at times to decide whether a fish has been in fresh water before or not. The majority of the scales, however, which are produced as evidence that a salmon has already spawned on more than one occasion, show a very considerable deterioration, both on the lateral and on the posterior sides of the scales.

But in " The Life History and Habits of the Salmon," Mr. Malloch says :

> " Many of the latter (late run fish) are so short a time in fresh water before spawning and returning to the sea, that very little damage occurs to the scales. When they appear in the river again it is,

therefore, sometimes difficult to tell whether they have been in fresh water before or not."

We cannot be far wrong in assuming, therefore, that a fish, whether it has spawned naturally or not, having once discharged its ova, will—if it be destined to recover—drop down to the renovating influences of salt water, and will in most cases carry some convicting evidence in the nature of scale marks denoting a past spawning condition.*

From these data and from my own observation, I consider:

1. That unless circumstances are favourable, and some fish of the male sex adjacent, the female fish will not spawn in a natural manner.

2. That a hen fish has the power and the organs for venting its ova should it not spawn properly.

3. That should it survive this abortive ejection of its ova, it will probably revisit its river on spawning intent.

4. That though there may be indelible signs on the scales, and, for *a time*, in the condition of the porus genitalis, which respectively indicate, first—that a spawning condition has approached, and secondly, that the passing of the ova through the genital passage has occurred, these signs do not necessarily imply that the ova has been deliberately deposited during sexual excitement.

5. A male salmon will eject its milt even before attaining the smolt stage, and without the presence of a hen fish.

* The first impulse of a wounded salmon—presumably impelled by instinct—is to descend to salt water to recover from its injuries.

Why, then, if a salmon spawns on more than one occasion, is not the kelt imbued with the same instinct and similarly impelled to descend at once to the sea in order to recover its condition and again continue its functions as a producer of its own species? It can hardly be that it hangs about in fresh water because it recalls the dangers which it has encountered in its passage from the sea, and fears in its weakened condition to face them again, because any danger must appear greater the more confined the waters of the river, in which it lingers for some unexplained reason. The answer to this question must be, that apparently no instinct or desire impels it to seek to recover its condition in order to spawn again, when once those spawning operations have been successfully accomplished.

6. The sex characteristics are interestingly illustrated in the life of the salmon. The male fish appears to enjoy a very lively time, partly occupied by a mixture of love and fighting, and to be somewhat indifferent to the more serious duty of life. The female fish, however, intuitively endowed with those instincts which lead to the preservation of species, remains unsatisfied until this duty is accomplished, *i.e.* until it has been able to spawn under the happiest natural conditions, and after having secured as far as possible the future safety of its ova. The male fish even if he fails in his initial attempt, rarely, if ever, re-attempts the arduous run up a river to the spawning beds, but the female, impelled by a higher instinct, will return again and again until it has satisfactorily achieved its life's purpose.

7. That so long as the markings or decrepitations on the scales are uncorroborated by evidence of natural spawning, it cannot be logically adduced that a salmon spawns, *i.e.*, spawns in a natural way, more than once in its lifetime.

8. From these and from the other facts and deductions which I have advanced in this chapter, I think it will be recognized that salmon have not so far been proved to spawn on more than one occasion.

I have only to add that in order to corroborate the conclusions I had formed—as expressed above—I thought it advisable to write to many of the most experienced of those in control of the salmon netting operations at the mouths of our big rivers, and in nearly every case I have to acknowledge their great courtesy and kindness in answering fully the somewhat lengthy series of questions which I propounded.

CHAPTER XV

MATTERS CONNECTED WITH FISHING FOR SALMON

Non-rising fish—Stoning a pool—Entering fresh pools—The Wye cast and how to fish it—A sagging line—Sinking the fly—Harling—Presenting the lure to the salmon—The rise of the salmon—Gaffing—Renting a fishing water.

It may occur to the reader that if salmon, while in fresh water, be actuated by an instinctive impulse to destroy all the possible enemies to their future young, they but too frequently display a considerable disinclination to respond to this call, and the lures with which he endeavours to awaken them to this duty, and incidentally to effect their capture, are, as a consequence, disregarded.

There are, however, several circumstances which may explain this apparent lapse of duty on the part of the salmon. In the first place, it is certain that salmon are not exempt from the natural laws which affect all living creatures. They require rest, and for this reason alone it is little wonder that they may at times neglect the instincts of hunger or destruction—whichever they may be—though perfectly conscious of the presence of the moving life around them.

In the second place, it can hardly be supposed that they are lacking in the wisdom which teaches the majority of created beings to avoid objects which have occasioned them pain, and which threaten danger.

In the third place, those inhabitants of our rivers and seas comprised in the families which are attacked by salmon, although progressing in a variety of different ways, are yet affected by the natural phenomena of the currents

which they have to encounter, and it is assumable that salmon will naturally avoid meddling with moving objects which do not conform to certain laws of progression through the element in which they travel.

Salmon may be roused from their inactivity at times by disturbing the pools in which they lie. Flies and lures can be altered to colours and varieties which may not recall to the salmon previous unpleasant experiences, and a variety of different casts may be made, which may cause the lures presented by the fisherman to the salmon to assume a more lifelike appearance and progress through the water. It cannot, therefore, be too strongly urged upon him who would be successful that a constant change in the methods of fishing any pool may be advisable, and a frequent change of flies desirable when the salmon are not taking well. While dealing with this aspect of salmon fishing it is by no means a bad plan for the fisherman to fish up and across stream if no success can be obtained by the ordinary method, in which case the line must be drawn through the water by reeling in, lifting the rod, or moving the point down-stream. I would go still further, and advise the fisherman to make occasional casts as with a dry fly. I have hooked salmon on the Test with a May-fly, and my experience is by no means uncommon. Salmon frequently take the March Brown when fished wet, and I believe they would do so were a fly similar in make and size to a May-fly fished on a fine single gut cast : the colours of the dressing of such flies might vary.

Stoning a Pool

Salmon, like all other fish, mistrust a moving object outside the water, but seem to exhibit a curiosity when smaller objects, such as spinning-bait, stones, moving leaves, flies, etc., enter their pool. Stoning a pool frequently

results in the salmon, as fishermen say, "coming on the feed," so long as no one on the bank is visible to them.

The salmon see the air bubbles made by the bait or the stones, feel the vibration of the water, or perchance hear in their own way the noise of the stone falling on the pebbles under water, and, although they may have appeared dull and listless at the time, they frequently become alert and excited, and at once attack the first moving object they see—apparently imbued with an instinctive desire to destroy the possible enemies of their future young—and to which they may reasonably impute the disturbance in the water. To watch salmon in a pool is an easy matter if the right spot is selected, and if the spectator approach with the greatest caution and remain apparently immovable and as much concealed as is possible.

A fisherman when wading does not appear to frighten fish so greatly as when he is standing on the bank. Salmon have followed my spinning lure, and taken it, close to my rod point, when I have been wading. For this reason, therefore, when playing a salmon from the bank, it is advisable to keep as low down as possible.

When Entering Fresh Pools

It has been repeatedly noticed that when salmon are running up a river they display considerable activity for two or three days after reaching any fresh pool. This cannot be due to an appetite forgotten during the final days of their stay in the lower pool, and resuscitated in response to the exertion of reaching the new water, because the run between these pools has on several occasions been particularly noticed, and it has not been of such a character as to exhaust the fish, and create a temporary demand for food. As a more likely explanation, it may be assumed that their instinctive desire to destroy the possible enemies

of their young may be brought into renewed activity by their new surroundings, and when they find that they have demolished the river life in the new pool they will be naturally suspicious as to any fresh moving objects which they see, especially if there has been no alteration in the water, such as a spate, etc. Salmon which have apparently ceased to take will, after a spate occurs and when the water is going down, commence to "feed." This, again, can hardly be due to the reaction attendant upon exhaustion, for the salmon have left the more rapid portions of the stream during the spate, and will have been resting in the less troubled back-waters of the river. It will most probably be due to the fact that they become aware of the fresh forms of life brought down by the spate, which they feel impelled to destroy, and consequently a spate may for this reason occasion their renewed activity.

The Wye Cast A General Suggestion as to how to Fish out a Cast

One cannot describe any particular method of fishing out a salmon pool which could, under every circumstance, meet with unqualified approval. The attendant and ever-varying factors associated with each day, with each river and each pool, must affect the method of casting and fishing, and this problem should therefore be considered by the waterside, and such a method of "fishing the fly" adopted as to bring your lure most naturally to the notice of a salmon, whose exact position, it must be remembered, is most often uncertain. No one method will suit every condition of the river, or will prove the most effective style of killing fish. Your judgment must tell you how and when to cast, when to fish near the surface, or when to let your line sink deeply in the water, whether to work your fly little or much, or whether to keep it perfectly still as it

slips through the water—your rod merely following the line down stream and round toward your own bank.

The following general method of fishing out a cast will I think meet with approval.

It must be remembered that, except in clear and shallow water, especially toward the end of a season when the fish are naturally shy, the rod point should be kept well down as the cast is fished out, as shown in Plate XXXVIII. The lower the rod is held the deeper the lure will sink and the less it will be seen, and therefore the greater will be the chance of your getting a fish. In fine clear weather, in summer time, and in shallow water, fishing the fly toward the surface can be adopted with perhaps greater chance of success, and even —as mentioned elsewhere—dry fly tactics may be resorted to.

The angle at which the fly must be cast, and at which the line should fall on the water—as regards the stream—should vary at nearly every cast, and though the variation between each cast may be a small one, yet it is certain that a judicious consideration of the exact spot at which your fly should fall will tend not only to successful fishing, but it will add enjoyment and interest to each cast. It is the assured feeling that salmon must be in the pool you are fishing which leads up to the interesting consideration of just how and where they are lying, so as to bring the fly—not the line—most surely and quickly to their notice.

In approaching any salmon pool it is well to remember that salmon are gifted with sight, and to believe that they are as keenly alert and equally as shy as trout ; also that any part of a run entering a salmon pool may carry a fish.

We will assume that there are no trees or other dangers behind you, and so you will fish this supposititious pool by using the Wye cast. The fly you believe in has been examined and is attached to your well soaked cast, and you have now to fish most carefully every yard of the run

below you, keeping as much out of sight as possible. You first lower the point of your rod down stream, paying out just enough line to fish the nearest upper portion of the run. When the line is fully extended, you face across stream to the spot at which you wish your fly to alight, keeping your rod pointing down stream while doing so. You then raise your rod steadily until the line is well to the surface of the water, and bring the rod steadily round until it is between your eye and the place at which the fly has to fall; then without stopping, convert this movement of the rod into the backward switch (see Plate XXXII.), pausing as usual to allow the line to extend itself behind you before making your forward downward switch. You then make your forward cast, lowering the rod into the normal fishing position. Follow the line with the rod—keeping the top pointing slightly up-stream—as the line and fly are carried down stream and brought into a straight line below you.

While your rod has been following the fly as it is swept down stream, you should be giving a series of steady up and down movements to the rod point, at intervals of about two seconds, which will have the effect of giving a slight jigging motion to the fly.

If a salmon has not acknowledged your fly, you can, after a short pause, during which you should continue to work the fly as it lies below you, repeat this cast, but this time vary the movement of working your fly, or do not work it, but let your rod sweep slowly round, keeping the top pointing as before at least twenty degrees above, viz., to the up-stream side of the fly.

You should now let out about a yard of your line and repeat your cast as before, taking care to cast as light and straight a line as possible, and fishing very carefully as your fly leaves the more rapid and enters the deeper part of

PLATE XXXII.

THE WYE CAST.

THE BACKWARD SWITCH OF THE SALMON ROD. THE BODY HAS TURNED TO THE PLANE IN WHICH THE LINE WILL FALL IN THE FORWARD CAST.

PLATE XXXIII.

THE WYE CAST CONVERTED INTO A GALWAY CAST WHEN DANGER HAS TO BE AVOIDED BEHIND THE FISHERMAN.

the water, for it is here that you will most probably find your fish. As your line gradually becomes longer, you can, just before lifting the rod, in each new cast, gather in about two yards of line, shooting the same at the end of each downward switch.

When you have covered the entire width of the water, you must move down stream, about one yard, and make one or more casts as before from this position ; and thus moving down the stream, and using just as long a line as may be necessary, cast steadily until you have fished out the pool. Do not attempt to use a longer line than you can comfortably lift from the water, and always lower the rod well to the water prior to making each cast.

You will thus have carefully searched every yard of fishable water. Avoid as much as possible fishing with a sagging line and vary your method of working the fly to suit the strength of the stream.

Always remain stationary while fishing out your cast ; do not move down stream until you are certain that no fish has followed your fly round to your own bank. If you move down stream prematurely you will probably frighten your fish by showing him the line, or create a sag in the line, and even if a fish should take the fly you would possibly be unaware of the fact owing to the slack line.

Treat a salmon with as much circumspection and respect as you would a trout. They are both wild and very shy, and neither will take your lures simply because you can cast well or happen to be wearing an attractive homespun fishing suit.

To the novice the above description will give a fairly general idea of how to fish any ordinary salmon pool, while every incident connected with each day's sport will probably tend to improve and better his method of fishing.

Salmon Fishing: A Sagging Line

When fishing from the bank it requires careful study and a good deal of skill on the part of the fisherman to prevent the sagging of the line due to the varying currents in the river across which it is cast. If the line has fallen straight in the desired direction, and there should be a tendency of the line to sag down-stream after the forward cast, the fish, when in a certain position, may possibly detect the casting line before he sees the lure. Again, if the fly be seized by the fish while a sag is in the line, the fly will possibly be ejected from the mouth of the fish without the fisherman being conscious of the fact. The line, if sagging, has not the power of a straight drag on the hook into the jaws, tongue, etc., of the fish. A short up-stream motion of the point of the rod, before the fly falls on the water, will cause an attendant up-stream curve of the line, and if the rod is kept pointing well above the direction of the fly until it has swept down into the full force of the current, much will have been done to avoid the objectionable sag and its consequences.

When the river is fast on one side alone, and if it be covered with one cast, it is well to fish from that side of the river which possesses the most moderate current, the fly being cast across the slacker water to the side on which the more rapid stream exists.

When a river is fast in the centre and slow towards the sides, the more directly the line is thrown across the current and into the slacker water on the other side, the greater the sag. Wading permits the fisherman in most cases to choose his own position for casting; he can, in consequence, generally avoid the danger of his line sagging, or having to make his casts from a position which might endanger the safety of his gear.

If a river is not wadable, and has a broad rapid current in the centre, the fisherman should content himself with fishing the faster water and his side of the stream, casting the fly well over but within the rapid portion of the river, and allowing it to come round into slacker water towards his own bank.

Sinking a Fly

Placing a shot on the line near the fly in order to sink it, does not appear to me to be an unfair method of fishing; the object being, of course, merely to bring the fly to the notice of the fish. If the fish be lying well down to the bottom, and the water be thick, a fly coming down the stream near the surface would easily escape its notice. This practice of leading a fly is frequently condemned as being opposed to legitimate fly fishing; it suggests a relationship to the method of snatching fish. The object, however, of the salmon or trout fisherman is to capture fish by lures which are meant to represent some form of water insect life, and the various flies which are thus used are meant to be presented to the fish. If the fisherman, therefore, chooses the only method of doing this—that is of presenting his flies—by placing shot on his cast, I sympathize with his effort, and not with these objectors, who are perhaps adopting an attitude having a greater relationship to their own ethics and ideas as to legitimate fishing, than to the absolute merits of the case. Personally, I dislike throwing a line to which shot are attached, but if the fisherman cannot otherwise attract the notice of the fish he is anxious to capture, he has my sympathy if he uses shot.

Harling

This method of presenting the lure to salmon can best be adopted in large and rapid rivers which are otherwise

unfishable. Harling is perhaps the most killing, but by no means the most interesting, method of presenting a spoon, a fly, or minnow to the notice of the salmon, the skill in presenting the lure depending on the manipulation of the boat by its two oarsmen. The fisherman sits in the stern of the boat, with his back to the bows. He has generally two rods, one over each quarter of the boat, and with about thirty yards of line out on each. The rods are fixed at right angles to each other, and kept in this position by shoes in the bottom of the boat for the butts, and cleats on the gunwale of each quarter for the lower joint of each rod to rest in.

A spoon or minnow is generally used as a lure on one rod and a fly as lure on the other. The lines are allowed to drift down-stream behind the boat, which, starting at the head of each pool, with the boatmen pulling slowly against the stream, is permitted to drop very gradually down the river. By the experience and judgment used in keeping the boat at the most judicious speed through the water, and moving in sweeping curves from bank to bank of the river, the lures tailing down-stream behind the the boat are presented to the salmon in the best possible manner.

The music of the reel and the pull on the rod at once inform the fisherman that he has a fish "on," and he, seizing with one hand the rod to which the salmon is attached, passes the other rod into the ready grasp of the after-boatman, who, having already thrown his oar aboard, is waiting to receive it. The fisherman then proceeds to play his fish, and while the after-boatman reels up the line on the spare rod, the other keeps the boat going. As soon as an opportunity offers the fisherman lands and plays his fish from the bank. The 50-pound salmon mentioned on p. 355 was killed in this manner.

Presenting the Spinning Lure to the Salmon

In fishing any pool, the speed at which the lure has to be drawn through the water is a matter of considerable importance. The line should be so cast that the lure commences to spin directly it enters the water, and a constant rate of speed should, if possible, be given to it—not too fast and not too slow. If you intend to vary the speed of each cast, it is better to impart the greater spin in the first casts, and gradually reduce this speed.

Don't attempt to cover too much water when casting—cover all that part of the river which you think is worth fishing, but without pressing. The best results can be obtained only when keeping the muscular action under perfect control. Never expend your last half-ounce of force in any athletic effort; always keep something up your sleeve—in other words, don't press.

The variation of the speed of the lure when fishing a pool is effected in two ways. The first and better way is to slack out or reel in the line by hand. The second is by moving the rod point. As, however, there must always be one best position for the rod when controlling the speed of the lure—preventing sagging—and while expecting a rise, any movement of the rod away from this position must of necessity be inadvisable if the speed of the lure can be otherwise controlled.

In spinning I have found it a good plan at times, and when the depth of the water permits, to vary the pace of the lure through the water by a series of half checks given to the rod action. This imparts first a sinking motion and then an accelerated one, the lure moving in a series of little spurts.

The Rise of the Salmon

Probably the most anxious moments of the salmon fisherman's experience are those which chronicle the rise

of the salmon at his fly, and it is well for the beginner to be in all senses ready for this event. The top of the rod should be kept well down and pointed in a direction about twenty degrees on the up-stream side of the lure, the line passing between one or more fingers of the upper hand and the rod. It is not advisable, as in dry fly fishing, to strike in order to hook your fish. Except when the fly is stationary or being drawn down-stream, the salmon should be allowed to fix the barb in its own mouth—*i.e.*, to hook himself—before a counter-strain is employed. Following the rise, except in the two cases just quoted, the fisherman should merely brace himself for action and keep perfectly still. If a quick stroke is made as the rise is perceived, the fly may be pulled or jerked out of the mouth of the fish, before the hook is in a position to enter the flesh. The salmon will, on closing his jaws, if time be given, shift the fly with the tongue toward the teeth preparatory to lacerating it. If the barb of the hook during this action happens to meet the skin either of the tongue or jaws of the fish, and the line be straight, the salmon will in most cases be hooked. There will always be sufficient pull on the hook itself, owing to the plunge of the fish or the drag of the line, to ensure the barb penetrating directly its point is checked by the skin. The drag and resistance of the rod and line will be sufficient to drive it well home. If, therefore, the rod is kept stationary the strain on the fly will be quite sufficient to hook the fish, and *should the barb never be in a position to enter the flesh* the fly will be rejected by the salmon naturally, instead of being jerked out of the mouth by a movement of the rod which would effectually scare the fish, and maybe prevent its taking any other flies presented to it later on.

So long as an object be moving, the salmon will invariably attack it with a rush ; but should the object be stationary in the water—*i.e.*, floating with the current—the salmon will

at times take it as gently as a big trout would take a drifting worm as it enters his favourite and shady pool. In this latter case, directly the first intimation is conveyed to the fisherman that the fly has been touched, an immediate and steady resistance to any such pull should be made.

When the fish is hooked, the rod should be held well away from the direction of the salmon, and the strain on the line should never be relaxed under any circumstances. This is necessary not only because the fish may be lightly hooked, or hooked on the bone, but in order to exhaust and finally to bring it into the most convenient back-water or quiet pool. Keep as much strain on your line as is safe, but try not to frighten the salmon at the onset into dangerous water by being rough. If a fish sulks get opposite to or below it and try a fresh strain on the rod.

Gaffing

If you have no one to gaff your salmon for you, keep at your fish until you have him beaten and into slack water. Bring your rod up over-head and backward with one hand, the line held for the moment between this hand and the rod, and as your fish presents his broadside slip the gaff quietly over its back, point sideways, just before the dorsal fin, turn the point right down, and with one strong and determined pull bring the point into its side, and drag the fish to the shore.

Never, never under any circumstances attempt to take your lure from the mouth of the salmon until it has received a most complete quietus—*i.e.*, until the salmon is incapable of motion. After you have administered the last rites with the priest place your rod carefully in some safe position, and, using the lancet in the disgorger of your knife, liberate each hook from the flesh. Keep the mouth of the fish open with the butt of your priest while doing this ; then weigh your

fish, and put the exact weight, length and girth, time of day, name of lure, the appearance of the fish, and the name of the pool down in your pocket-book. You will remember the rest if necessary when you get home.

Renting a Fishing Water

No investment is so unfortunate, or so extremely mortifying, both to the lessee and to his guests, as the renting of an indifferent salmon fishing.

Before renting a fishing write to the last two preceding tenants.

Always consult your solicitor before signing an agreement.

Remember that even the most unpleasant and disappointing river may at times and in certain places produce good returns. Some rivers will, following a spate, yield plenty of fish, but it is worth remembering that you can seldom command a spate.

Fishing agents may be expected to quote the best year's returns and not the worst. No rivers are always good.

There are bad months for even the best of fishings.

It is advisable, before concluding an agreement for renting a salmon fishing or trout water, to find out first whether the fishing about to be taken includes the right to fish beyond the middle of the stream. In many salmon and in some trout rivers which are offered for yearly rental, the better part of its various pools, as often as not, lie under the farther bank, and if the fishing on the opposite side of the river be not included in the lease which you have acquired, the lease will not give you the right to fish beyond the middle of the stream. The fisherman, having the right to fish from one bank only, can only fish " ad medium filum "—that is to say—he must not fish beyond an imaginary line down the exact middle of the water in the river, otherwise he renders

himself liable to an action in law, by the owners of the fishing rights of the opposite bank. In many streams, however, an amicable arrangement is arrived at which obviates any difficulty on this point, but it is advisable to find out whether such an arrangement as this can be relied on for renting a trout or salmon water. It follows from this, that if possible, not only should a chart of the fishing water be carefully considered, but that a visit to the river should be made before any agreement is signed.

CHAPTER XVI

SALMON FLIES, KNOTS, GUT, AXIOMS, ETC.

Salmon flies—List of flies—Hooks—Flexible eyes—Metal eyes—knots—Useful axioms and hints when fishing.

The salmon can by no means be classed as the lowest of its order in the scale of the vertebrata, and, quite apart from instinct, memory influences to a greater or less degree the life of every vertebrate ; this may explain why a salmon will allow certain flies to pass by unmolested, but will, without hesitation, attack a different coloured or a different sized fly.

It is, I think, generally agreed that fish are able to distinguish colours and tones. In every salmon river, there are certain flies which are tried over and over again by the fisherman as being the ones most likely to succeed, and the salmon, after being some time in fresh water, will naturally remember the size and the colour of the nasty prickly things by which it has so frequently been startled, and however much its instinct might compel the destruction of moving aqueous life, it—as a consequence of its former experience—will be unlikely to tackle these particular flies. I think it is important therefore, as the season advances, or some time after a run of clean fish has ceased, to try flies other than the popular few.

Those whose water is so situated as to give them the first chance at fish as they enter a river may, with every possibility of success, content themselves with some ten or more flies, say—the Thunder and Lightning, the Black Doctor,

the Durham Ranger, the Silver Doctor, the Jock Scott, the Popham, the Black Dog, the Blue Doctor, the Silver Grey and the Butcher.

But it is because these flies are so frequently used that they must be familiar to a salmon who has run any distance up a stream, and they will therefore probably inspire caution or fear. For this reason I think that for those who fish late in the season and higher up a river, salmon flies such as those included in the following list might supply one whose appearance would provoke aggression and not caution.

Salmon Flies

I do not think it necessary to give a complete list of the names of the many (about 140) Salmon Flies known to the fishing world, but I think it will be useful to my reader if I give the names of some twenty of the most generally used in Great Britain and Northern Europe.

If the beginner will be content to stock these flies in the sizes I recommend, I think he will probably find that he has all that are necessary on any stream he may visit and, that though the number and variety of his flies will increase, he will not, with the flies I have suggested, be likely to find his book stocked with specimens upon which his gillie or his friends will frown.

The Name of Fly.	Range from No.	to No.
Butcher	2/0	4
Gordon	2/0	3
Golden Eagle	3/0	1
Silver Doctor	0	3
Blue Doctor	0	3
Black Doctor	0	4
Jock Scott	2/0	3
Black Dog	0	3
Dusty Miller	0	3
Popham	1/0	3

The Name of Fly.	Range from No.	to No.
Durham Ranger 7	2/0	3
Thunder and Lightning ..	1	4
Wilkinson	1	4
Childers	2	5
Murdock	0	3
Stevenson	1/0	3
Grey Heron	2	4
Fiery Brown	1/0	3
Silver Grey	2/0	2
Golden Olive	1	4
March Brown	2/0	5

When ordering flies under the new numbering, for 2/0 read 16, for 1/0 read 15, for 1 read 14, for 2 read 13, and so on.

Hooks.

The hooks which I think preferable to all others are the Cholmondeley-Pennell Limerick Hook, with turn down eyes and upturned shanks.

The numbers used with the list of flies I have given are those commonly used with reference to the salmon flies supplied by dealers. The sizes range from Nos. 5/0, 4/0, 3/0, 2/0, 0, 1, 2, and thereon down to 17, which represents the ooo hook, the smallest sized trout fly hook used.

The catalogue of most fishing tackle dealers will show the size of the different hooks, and when ordering flies through them, it is advisable to use whatever system of numbering they adopt.

The size of the hook, *i.e.* ,the fly, to be used when fishing will depend to a large extent on the time of year and on the state of the water. In the spring the larger salmon flies are generally used and found to be most effective. In the early summer the medium sizes are preferable, while in the full summer and in the autumn, the smallest flies are generally the most killing. In flood waters, the sizes used should be relatively larger. When possible, however, obtain the

FIG. 1.

FIG. 2.

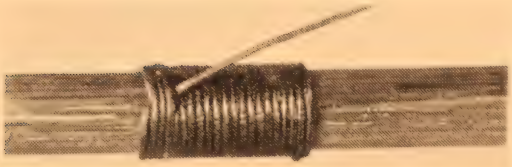


FIG. 3.

SPLICING THE ROD.

1.—PASSING THE END THROUGH THE LOOSENED TURNS.
2.—THESE TURNS DRAWN TIGHT.
3.—THE SLACK LINE PULLED THROUGH.

FIG. 4.

LOOSE.

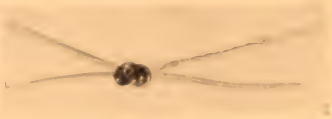


FIG. 5.

TAUT.

MAKING THE LOOP.

FIG. 6.

FIG. 7.

THE LOOP FOR THE STEEL EYE OF THE SALMON FLY.

advice of those who are acustomed to fish on the water to which you are going.

An assortment of nine or ten of the different flies most likely to be suitable on the river and to the conditions of each day, can be carried by the fisherman in a small Japanned fly box.

The salmon fly book in which are kept the main stock of flies can generally be left at your sleeping quarters. The fly book is to the salmon fisherman, what the trout fly cabinet is to the dry fly fisherman.

If possible salmon flies should be thoroughly dried before being put back into the case, or returned to the salmon book. It is not a bad plan to have a large safety pin, on which to string the flies as they are taken off the cast, securing the pin to the cap.

If the feathers, etc., used in the flies are of the best material, and if these be carefully tied on the best quality of japanned and eyed steel hooks, each fly dried after use and before being placed in the fly book, box or cabinet, and protected against moth in the off season, the usefulness of each fly will extend over many years of active fishing.

Shop dressed flies are "things of beauty," but rarely "a joy for ever"; and a considerable portion of their top dressing can frequently be dispensed with (see Captain de Winton's letter, page 348).

Knots and Gut. Flexible and Metal Eyes

Salmon flies, the eyes of which are made with flexible material, are readily and easily attached to your cast, and if the end of the final strand of your gut cast be made into a loop, the lower bight of this loop can be threaded through the eye of the fly, and passed down and over the body of the fly. The loop can then be drawn close up to the neck of the eye.

The loop in the end of your salmon gut cast should be formed as follows. The gut is well soaked. It is then doubled, being turned up for about three inches. A single overhand knot is then made on the bight (Plate XXXIV., Fig. 4) and drawn taut (Fig. 5). It is a good plan to hang a weight of three pounds or so, for a couple of hours on to the loop thus formed. It will draw the softened gut well together, and the end can then be cut short off, or whipped with fine waxed silk.

If the end of your cast be single, then for a flexible eyed fly no fastening is more effective than a single sheet bend, with the end brought up round behind the gut, over the eye, and down between the loop of the sheet bend. (See Plate XXXV., Figs. 1, 2 and 3).

Remember always that it is in the flexible eye of the fly, and in the end of your cast, that the greatest play will occur, and in which the greatest danger may be feared.

A loop in the end of your cast, so long as it is carefully tested each day, lessens some of the dangers, for it is strengthened by being doubled, but it will then be the flexible eye of the fly which will require the greatest attention, that is if the fly be frequently used.

It is for this reason that many fishermen prefer a metal eyed fly ; no danger of deterioration occurs, and the metal eye adds to the sinking qualities of the fly. If the steel eye of the fly be sufficiently large and a loop be used on the end of your cast, this can, when soft, be passed through the eye and over the body of the fly, and then drawn taut just below the eye. (See Plate XXXIV., Figs. 6 and 7).

To avoid danger see that both the end of your cast and the flexible eye of your fly are softened and pliable before attaching them to one another.

A metal-eyed salmon fly, unless it is properly shaped, has a greater tendency to weaken or break the end of your

FIG. 1

A SHEET BEND.

FIG. 2

UP ROUND AND DOWN THROUGH.

FIG. 3

TIGHTENED.

FIG. 1, 2, 3.—SHOWING THE METHOD OF ATTACHING THE SINGLE END OF A CAST TO THE GUT EYE OF A SALMON FLY.

FIG. 4.

THE CAST KNOT LOOSELY TIED.

FIG. 5.

TIGHTENED.

FIG. 6.

DRAWN TAUT.

FIG. 4, 5, 6.—THE KNOT FOR FASTENING THE DIFFERENT ENDS OF GUT TOGETHER WHEN MAKING UP A CAST.

gut than a flexible eye. The inflexible character of the metal eye lends no assistance to the gripping nature of the end of the gut cast.

The knot which I advocate for the small trout fly is not a safe one for larger hooks, for the single turn through the metal eye of the salmon fly subjects the gut at the bend to much too severe and abrupt a strain. Another disadvantage of this knot when used for a salmon fly is that some portion of the end of the gut point has to be sacrificed, *i.e.*, cut off, when the fly is changed.

The most simple method of fastening gut to gut is that shown in Diagram 7, but the most reliable one is that which should be used when making up a gut cast. It is formed in a somewhat similar manner to the blood knot made by sailors, formerly used in the cat of nine tails, but is made with two ends instead of one, as follows:—

1. Place the two strands of gut together, end to end, but over-lapping a few inches, then twist the ends round one another six complete turns.

2. Divide these turns in the centre by the pricker of your knife.

3. Bring each end back and pass them in opposite directions through the opening made by the pricker. (See Plate XXXV., Figure 4).

4. Take the other parts of the gut between the smaller fingers of the two hands, and, gently pulling on them, work the turns closely together with the fingers and thumbs (see Figure 5).

5. Draw this knot quite tight (see Figure 6).

6. Cut off the short ends close to the knot.

The gut should always be well soaked before this knot is tied.

Useful Axioms and Hints When Fishing

The quality which will prove invaluable to the salmon fly fisherman is that of perseverance. By persistently presenting his lures throughout a long day in every possible position likely to harbour a salmon, and by continuing to concentrate his energies with care and attention on the purpose of fishing, he will with average luck eventually establish his position as a successful salmon fisherman.

It is the billiardist who can continue to concentrate his attention on each effort he makes, who will compile the biggest break.

The probable average response of the salmon to the efforts of the fly fisherman throughout the year does not exceed more than two per diem, and the fisherman does not secure more than one fish for every four rises at his lure. That is to say, however careful he may be in his methods of casting and fishing out his cast, and however persistent he may be in presenting his lure to the fish, the average fisherman is not likely to secure more than one fish for every two hundred casts he makes, and therefore 196 of these casts will, so far as he is aware, fail to move a fish.

As it is impossible to say at what time of the day, at what part of his water, or at which moment of any cast, he may be lucky enough to meet with a response, the patience required in order to continue casting with unvaried attention to every likely spot, and without any view of his quarry, or any certainty of there being a fish in the pool he is fishing, may be well imagined.

The moments when a salmon will take are as uncertain in their occurrence as those of trout. They seldom take when a mist is on the water. They will both take at the com-

mencement of a rise in the river, but neither will take during a rising flood. With these exceptions, however, no hour between dawn and night may be looked upon as being an impossible one for salmon fishing

Salmon are taken on the fly during the night, but after dusk—a favourite hour—I must confess to losing my interest in fly fishing.

As with trout, I think the best hours for salmon fishing are between 11 a.m. and 2 p.m.

No place in any salmon river can be regarded as being an impossible lie for salmon, and while local knowledge and experience are valuable, instinct and general experience are factors which should always influence the salmon fisherman. The state of the river, the time of year and day, also the meteorological conditions, are potent factors in determining the position of salmon in each pool.

Salmon frequently take well in rainy weather, and for this reason it is well to carry with you a light waterproof coat.

It is better to vary your method of working the salmon fly when fishing out your casts. Not only will this be instructive and possibly lead to success, but it will help to relieve the monotony attendant on a long and possibly blank day's salmon fly casting. Unless one is fortunate in getting fish, patience is very much wanted when salmon fishing, as long days of unrewarded and possibly unrecognized effort lead to weariness of mind and body.

It is the extreme end of your line and also of your cast which is the first to deteriorate. It is to the condition of these that your attention should be directed.

Force in Salmon fly casting should be derived from the weight of the body through the arms to the rod, and not from the exclusive action of the muscles of the right or the left arm.

Do not cast your fly any further than is necessary to cover the likely water of the pool or river you are fishing. Try and fish your water by casting as much as possible down stream. The more you throw your line across the stream, the greater the chances of a sagging line. Across and down you must cast, but down as much as possible.

The salmon fly which is most deadly is that which is fished on the straightest line.

When into a fish have your line well reeled in and keep as near to the fish as possible; also do not let your line drag in the water.

A slack line leads to danger, and it also prevents your bringing pressure to bear at once on a fish which has taken the fly.

As the salmon comes in towards you, be as still as a statue, and when you are certain of your fish then gaff it.

Keep the point of your gaff sharp.

Carefully examine and test your fly and cast after killing a fish.

Movement can most easily be given to the fly at the end of a straight short line. With a long line much of the impulse given to the rod will be lost ere it reaches the fly.

When a fish sulks, do not let him rest or foul your line, but alter your position on the bank if possible as soon as you can, until you are opposite or below the fish, and if you then bring your rod sideways upstream and well back, you will soon move him.

When fishing the lower reaches of any salmon river, and when the water is discoloured, or the river full, heavy rods,

lines, and lures can be used, and with advantage ; but when the water is small and as clear as crystal the lighter the rods, tackle and flies, the greater should be the success in getting fish.

Fish carefully but quickly. Do not potter in your fishing and as much as possible avoid showing yourself.

Rough weather, or tumbled water, especially in the summer time, is a factor in favour of the salmon fisherman, probably because the breaking and tumbling of the waves oxygenates the water and enlivens the fish.

It is believed by many experienced fishermen that sea-trout and salmon seldom take while on their initial run up a stream, and not until shortly after they have reached and settled for the time being in a pool ; but if they have been washed down they may take at any time or anywhere for the first day or two after the spate has begun to subside.

My reason, for saying this, is that I have so frequently hooked a discoloured fish in the more rapid parts of a river and in the most unlikely places for a salmon to lie.

The record salmon for 1907 was caught by myself after a spate on the Namson River, in the middle of a run between two pools, and in a portion of the river in which it seemed impossible for a fish to rest. From its appearance this salmon must have left salt water at least two months previously.

While the colour of a salmon fly is undoubtedly of some importance in securing fish, the size of the fly is of even greater consequence.

The fly which has killed your last fish will be the one you fancy, but perhaps not the best.

So long as the barb is sharp enough to effect a lasting attachment, and the eye strong enough to stand the strain of a fight, the more knocked about an ordinary shop dressed salmon fly is, the more effective it very often appears to be when fishing for salmon.

It should also be remembered that after a spate the minnow and the fly may at any time of the year be used with equal chance of success.

Generally speaking, the deeper the lure when wet fly fishing or spinning the better, for the less distance that a big fish has to move, to the lure, the greater the chance of securing it.

Spin slowly, as long as the bait spins freely.

The perfection of a spinning reel does not consist in the distance a lure can be thrown, but in the mechanical perfection of its mechanism to the object of fishing.

When wading be especially careful as you approach the head of any salmon pool—a rapidly shelving soft bottom, or a rocky ledge and a strong stream behind the fisherman have proved potent factors in many cases of drowning.

Don't, therefore, wade deeply when directly above and approaching the head of a salmon pool.

Lower the rod well down, and always take in sufficient line before making a fresh cast, to make your back cast successful.

Be certain that your salmon has received his *coup-de-grâce* ere attempting to disengage the lure from its mouth.

After a salmon has received its *coup-de-grâce* there are two periods during which its flesh should be cooked and eaten. The first period is from one to four hours after it has ceased

to live, *i.e.*, before rigor mortis has set in, and the second period occurs when rigor mortis has passed.

It is incomparably better to cook and eat the fish, or indeed any flesh, before it begins to stiffen. This period, however, is a short one and variable in its length, depending on temperature, meteorological conditions, and the circumstances attending death.

The period during which the flesh should not be cooked and eaten, that is the period when rigor mortis continues, is also variable. Its duration can easily be detected by handling the fish or flesh.

A Refractory Joint.

Owing maybe to the want of a little mutton fat, the sockets connecting the different joints of the rod may at times become fixed, or stuck together, and the greatest care must be used in separating them, in order to avoid injuring the delicate material of the rod.

If, when you are taking your rod to pieces, you find that you cannot disengage any two of its lengths, you should proceed as follows :—Wet one corner of your handkerchief or any strip of strong linen, and opening out the end, wrap it on the smaller joint of the two pieces, about six inches from the socket, then bind the linen tightly round the rod, the first two turns of the linen over-running its own end, and thus passing this ligature tightly round and round the rod, continue until the turns reach the joint.

If the end of this ligature be now grasped in one hand, it will hold the upper and smaller end of your rod firmly and safely, and if the thicker joint of the rod be grasped by the metal socket and twisted round, the refractory joint will in most cases be easily and safely disengaged.

If, however, the two joints of the rod are still inseparable, place yet another strip of linen or your handkerchief in a

similar manner about six inches below the refractory socket of the lower joint, but making the turns in the opposite direction to those already placed on the upper joint, and thus winding this new ligature tightly on the rod, continue until it reaches and covers the metal portion of the socket. The two ligatures will now meet one another at the refractory socket, and if they are grasped firmly in the two hands will permit a perfectly safe but firm grip to be made on the two joints, and they will thus be easily separated.

If the fisherman finds that the linen or the handkerchief does not grip the rod, he can first pass a little of the small end through the nearest ring, and then down the joint, overlapping this end, with the first turn, etc.

If, when near home, you find the sockets fixed together, take the two joints into the house, and by leaving the rod until the morning, the dryness and warmth of the room in which it is kept will probably loosen the sockets or at any rate considerably assist their ultimate separation.

When the joints are separated, see that they are rubbed clean with a dry rag, and then kept well greased with mutton fat in the future.

As with golf, so with the salmon rod : don't press. It is knack and not strength which achieves the best and most accurate casts. Never exert your last pound of strength ; keep well within the limit of your power. A correct action is perhaps the most important art in fly casting. At the finish of any cast, if there is any slack line hanging below the upper hand and the winch reel up at once ; never have any slack line before the winch when expecting a rise.

CHAPTER XVII

METHODS OF CASTING A SALMON FLY

The action of the salmon rod.—The position of the salmon reel—The salmon rod—The right-handed overhead cast—The forward cast—The left-hand overhead cast—The Wye cast—The side cast—The Galway cast—Curved casts—The loop cast made in one plane—The loop cast made from left to right—The same cast from right to left—The switch cast—The Spey throw—The Suir river cast—A variation of the Wye cast when danger is behind.

As I have stated already, in each and every cast which can be made, the movements of the double handed rod are exactly similar to those made by the single handed rod, the only difference being the manner in which the rod is held and the method in which the force is applied.

Bearing this in mind, the reader must not be surprised if I do not deal with the various casts with the two handed rod at such length as I thought necessary when dealing with the single handed rod. Therefore, while saying all that is necessary to aid the beginner in learning how to make each of the various casts with the salmon rod, I am relying on him to have first studied the respective casts with the trout rod.

I shall, however, accompany my description of these casts with certain plates which I think will assist the student not only with the salmon rod, but with the trout rod. Many of these plates will be from instantaneous photographs taken when actually casting, and the line will be shown exactly as it appeared on the plate, but in some cases, this line has been very carefully strengthened, so that in the half-tone process, its reproduction may be readily discerned.

It is now necessary to consider the manner in which the Salmon rod* should be held, the position of the body, the angles through which it should move, and the method of applying the necessary force in the backward and forward casts and the position of the reel.

The Position of the Salmon Reel

In salmon fly casting, if the fisherman uses most commonly the right-hand cast—that is, the cast in which the right hand is uppermost—the handle of his reel should be facing the left hand, for he can then most readily use it when fishing out a cast, or when playing a fish, without shifting his right or upper hand. The butt of the rod can rest either in the belt socket, or against the body, while the left hand easily controls the line and reel. If the left-hand cast is generally used, the handle of the reel should face toward the right. If both right and left hand casts are equally employed in casting, then the position of the handle of the reel may be left to individual choice.

The Salmon Rod

The student should always bear in mind that in every method of casting with a salmon rod, the rod has to move through the same angles and with similar relative velocities as the trout rod, when it is employed in making the same kind of cast, and a study of the casts described under the head of trout casting, Chapter X., will greatly facilitate the ability to cast perfectly with a salmon rod.†

The salmon rod is held by the two hands, about two feet apart, one being above and the other below the reel.

* For convenience I shall allude to the double-handed rod as the salmon rod.

† Francis Francis says :—" A good trout fisher will easily become an expert at salmon fishing, but a very respectable practitioner with the salmon rod will have all his schooling to do afresh, before he can take rank as a master of the art."—*A Book on Angling*, 1885.

PLATE XXXVI.

RAISING THE SALMON ROD IN THE BACKWARD ACTION.

PLATE XXXVII.

THE CORRECT POSITION AT THE END OF THE BACKWARD SWITCH.

PLATE XXXVIII.

THE AUTHOR ON THE USK FISHING OUT A CAST.

THE NORMAL POSITION FOR FISHING.

The hands grasp the rod firmly, the thumbs being extended along the handle. In the normal fishing position the arms should be inclined downward, the hands holding the rod in a nearly horizontal position, one hand being just behind the hip and the other in front of the body (see Plate XXXVIII.).

The Right-handed Overhead Cast

The normal manner of standing and holding the rod before making this back cast is as follows :—The right foot should be in advance and pointing in the plane in which the line has to travel, the weight of the body being evenly distributed between the two feet.‡

The right hand grasps the handle of the rod above the reel, the left hand being below it ; the right arm, shoulder and foot should be pointing forward, and the rod held well down (see Plate XXXVI.).

The object of the back cast is to extend the line in the air behind the fisherman, to a point opposite to that at which the fly has to alight at the end of the forward cast.

In making the backward cast the rod is first raised and brought slightly forward with both hands, so that its top rises vertically upwards. See the position of the hands, arms and body in Plate XXXIX.

The backward action is then made in the vertical plane of the body by moving the two hands in opposite directions, pulling back the right hand and pushing forward the left one, and at the same time slightly raising the rod. The Diagram 16 and those showing the movements of the trout rod should be again considered, as they also show the angles and the movements, etc., made by the salmon rod.

‡ The left foot should not be in front unless the left hand is uppermost on the rod, as it most certainly detracts from the command over the forward cast. The right hand dominates the right handed cast, therefore the right side and right foot should be in such a position as to give it the greatest power and assistance.

DIAGRAM 16.

Figures A, B, C, and D show the movements of the arms and rod in the backward cast.

A, the general elevation of the rod when fishing.

A, B, C, D, the sweep of the rod in its backward action.

D, the angle at which the rod pauses before commencing the forward stroke.

D, C, B, A, The sweep of the rod in its downward action.

The upper, or right hand, must be drawn backward with an accelerating motion to a point just above the head, while at the same time, the lower or left hand, acting as a moving fulcrum to the force applied by the right hand, is forced forward, the rod being checked, as shown, at an angle of about twenty-two degrees behind the vertical line of the body. (See Plates XXXVII. and XL.).

The rod, as it is raised (see Plate XXXIX.), being retarded at its point by the weight and frictional resistance of the water to the line, bends downward and the right hand becomes the dominant power, while the left hand is the secondary power as well as the guiding force and the fulcrum on which this power works when making the back cast, a point midway between the two hands being the pivot on which the action

PLATE XXXIX.

THE END OF THE RAISE AND THE BEGINNING OF THE BACKWARD SWITCH.

PLATE XL.

THE END OF THE BACK SWITCH.

NOTICE THE ALTERED POSITION OF THE SHOULDERS AND ARMS.

of the rod is centred. The upper hand will make similar curves to that of the hand when using a single-handed rod. (See Diagram 17.)

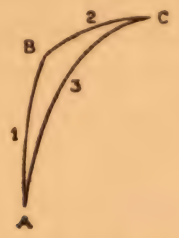


DIAGRAM 17.

The sides 1, 2, 3 of the triangle A B C represent the upward, backward and downward motion of the upper hand in the overhead cast with a salmon rod.

The object of moving the rod in a vertical plane is to give absolute accuracy to the forward cast. Even if the rod, as in some of the other methods of casting, be moved from one plane to another, it should always when possible—in order to insure accuracy—be brought down in the vertical plane in which is situated the spot at which the fly has to alight.

The power in this backward pull of the right hand is derived from the weight and movement of the right hand side of the body as it turns or twists—on the ankles—to the right, until the shoulders are square with, *i.e.*, facing the point, to which the fly has to fall, and the force thus originated is applied to the rod through the right shoulder, arm and hand. Neither the right nor left arm in this backward movement is straightened. The right elbow is raised and moved backwards sideways, and the rod, brought vertically back, is checked directly above the top of the head, the line of sight being to the right side of the handle of the rod. The spinal column acts as a vertical centre, the left shoulder and left arm are thrust forward during the movement, the head being kept absolutely steady and the eyes fixed in the direction in which the fly has to fall (see Plate XXXVII.).

If anything the action of the lower hand should be made with less force than that used by the right hand when making the back cast. The lower hand should not be extended to the full length of the arm, but should be brought to a sudden stop ere this be reached, and the upper hand should be stopped as it reaches a position immediately above the head (see Plate XXXVII.)

In the preliminary practice, when making the first back cast, the upper hand should, when holding the rod, enclose the line above the reel, the thumbs should be extended along the rod, and the line should run out in a straight line in front of the student.

Assuming that this practice is taking place over grass, the point of the rod should be lowered prior to making the back stroke, and the slack line taken in.

The rod should then be steadily raised in a vertical plane to an angle of about sixty degrees, and continued into the back cast by a switching action precisely similar to that used in the backward action of the trout rod, the force applied to the rod being a pull which increases in strength until the rod is checked as it reaches an angle of twenty-two degrees behind the vertical line (see Plates XL. and XLI.). The line in the latter Plate is shown as curling back.

For the correct position of the arms, hand and rod, at the conclusion of the back cast, see Plate XXXVII.

A pause, slightly longer than that made with the single-handed rod, is necessary to allow the line sufficient time to extend itself behind the fisherman, and at the end of this pause the forward cast should be made.

The Forward Cast

The left hand is the dominant power in the forward cast and pulls the butt end of the rod horizontally backward

THE LINE EXTENDING ITSELF BEHIND THE FISHERMAN AFTER THE BACKWARD SWITCH OF THE SALMON ROD.

towards the hip, its power being derived from the left shoulder as the body turns—on the ankles—to its former position. The right hand in this movement is the secondary power, which guides and forces the rod down and acts as a moving fulcrum.

As the body turns or twists to its former position, it thus supplies the power through the shoulders, arms and hands to the forward cast.

As the rod moves forward and downward, its point bends backward toward the fisherman (see Plate XLII.), and straightens itself after it is checked.

In mentally considering these instructions it will be well to concentrate the attention on the right forefinger and the left thumb in the backward action, and on the left forefinger and the right hand thumb in the forward and downward action.

The forward and downward action of the forward cast should be checked when the rod has reached an angle of about thirty degrees to the horizon, and the rod is then lowered by bringing the left hand back to its original position (see Plate XXXVIII.).

I think, until the correct backward and forward motion of the rod has become a matter of habit, a great assistance, in order to obtain the correct action, is to think of my suggestion made under the head of " Trout Fly Casting," as to there being a portion of clay pressed on to the tip of the rod, which has to be switched off the rod in a horizontal direction. If the correct rod movement is made, a clay ball fixed to the top of the rod would be flicked off either backward or forward, and it is by exactly similar movements of the rod that a perfect backward and forward extension of the line should be obtained.

The greater the force of the wind against the fisherman the lower the downward impulse of the rod.

The sudden stopping of the backward or the forward motion of the rod at the moment of its greatest tension will give the flicking off impulse so essential to a perfect cast. The rod must never be jerked at the commencement of any stroke, but *drawn*, the force gradually increasing up to the moment when the rod is suddenly checked. The hand or hands must always grasp the handle of the rod firmly at the conclusion of each of the backward and forward motions. This grasp will of necessity produce a rigid wrist, and should therefore assist the sudden check which is so important.

If, therefore, the backward motion of the rod and line has been properly made, and if the correct forward motion be then given to the rod, the impetus imparted to the line will be sufficiently great to pull through the rings of the rod from one to three yards of the slack line between the hand and the reel; this adjunct to all good casting is known as "shooting the line." When fishing it secures the following advantages; a greater length in the cast, less exertion to reach the desired spot with the fly, greater accuracy, and a lighter fall of the line on the water. The line will only shoot, however, when the correct forward action of the rod is made. In order to permit this extension of the line, it should be released—as with the trout line—after the rod is brought to a stop in the forward cast, and, if necessary, the spare line should be fed up toward the lower ring with the left hand, the butt end of the rod resting either against the body, or in the butt-rest in the belt of the fisherman.

The Left-hand Overhead Cast

In this cast the left hand should be above, with the thumb pointing up the rod, and right hand below, the left foot and shoulder pointed forward, the action of the rod and the motion of the arms being precisely similar to the

THE END OF THE DOWNWARD SWITCH WITH THE SALMON ROD.

right hand cast, the hands merely changing their places on the rod.

Assuming that *practice* is now taking place over still or running water, the point of the rod should be lowered well toward the water prior to making the back stroke; the current will then take out, or the fisherman may take in, any slack line, and as the rod is steadily raised accelerando the line will rise well to the surface until the fly be just about to leave the water, when the action is ended by a quickening backward switch, the force applied to the rod being a pull which increases in strength as the rod goes back, culminating as the butt of the rod reaches an angle of twenty-two degrees behind the vertical.

The use of the double-handed trout and salmon rod is nearly always confined to the wet fly method of fishing. The fly or flies are mostly fished across and down stream, and are generally thrown to an angle of about sixty degrees across the direction in which the current is flowing. The fly or flies are sunk below the water, and drift down stream round towards a point immediately below the fisherman, his object being to make his lure work in such a manner as to be easily seen, and to vary the appearance it presents to the fish.

The Wye Cast.

This cast for the salmon rod has already been described in Chapter XV., and for the single-handed rod in Chapter X.

The Side Cast of the Salmon Rod

The movements and velocities of the salmon rod, when making the side cast, are precisely similar to those of the trout rod described in Chapter X., and are an exact replica of the overhead salmon cast made in the horizontal instead of the vertical plane.

The Diagrams 9 and 12 can again be referred to, and, if considered as being drawn in the horizontal instead of the vertical plane, will show the exact angles and bends which a two-handed rod should make in this cast, the two hands being employed instead of one, and moving against one another in the horizontal plane instead of the vertical one.

Before making the backward cast, the rod should be lowered and all slack line taken in. The rod should then be raised in the vertical plane—in order to get the line well on the surface of the water—and then brought down sideways until it is about forty degrees to the right hand of the fisherman as he faces the direction from which the fly is being raised, and about thirty degrees above the horizon.

It is then switched back with a slight upward tendency to the angle of twenty-two degrees horizontally behind an imaginary line drawn at right angles to the fisherman. It should then be pointing at about thirty-five degrees above the horizontal, and after the necessary pause to allow the backward extension of the line, the forward cast is made, the rod being checked before it reaches the direct line in which the fly has to fall.

The Galway Cast

This effective cast has already been described for the single handed rod (see page 186) and if these instructions are carefully studied the Galway cast can easily be made with the salmon rod.

The rod is first raised to an angle of about sixty degrees, the hands, arm, rod, etc., being held as in the overhead cast, the thumbs up, the knuckles down, both arms bent and the reel below the rod, the line being extended well in front of the fisherman.

As the body turns in the direction of the back cast, the weight is transferred from the right to the left foot.

PLATE XLIII.

THE GALWAY CAST.

AFTER THE BODY HAS TURNED AWAY FROM THE WATER AND BEFORE THE RIGHT FOOT HAS BEEN BROUGHT FORWARD.

PLATE XLIV.

THE GALWAY CAST.

AFTER THE BACK CAST HAS BEEN MADE AND AFTER THE BODY HAS TURNED FORWARD AGAIN, BUT BEFORE THE RIGHT FOOT HAS BEEN BROUGHT FORWARD.

the latter pivoting round on the toe as the body turns, and supporting the weight of the body until the foot is brought forward. During this movement the position and direction of the rod remain about the same, the point merely rising from ten to fifteen degrees in the air so as to keep the rod in touch with the line. The rod is twisted so that the reel now becomes uppermost, the thumbs and knuckles also reversing their positions. The arms remain bent and the body assumes the position which it should have at the conclusion of an overhead backward cast. The elbows, etc., of the fisherman are moved in sympathy with the action.

The right foot is now brought forward and as this is being done the forward and downward switch is made, but in a direction which avoids any possibility of danger, so that in reality what should have been a backward cast now becomes, owing to the turn of the body etc., a forward cast in the backward direction. The rod however, is not brought down to its usual level, but is checked at an angle of about fifty degrees above the horizon.

While the line is extending itself the body again turns round to the left, and faces the direction from which the line has originally been taken and to which the fly has now to be directed. The right foot again swings forward, and, as by this time the line has fully extended itself, the forward and downward switch has to be made as in the overhead cast. Plates XLIII. and XLIV. clearly show the foot and the body movements during this cast. In Plate XLIV. the foot is shown leaving the ground and the forward cast being made, the line being seen as extended.

The Galway cast is a very pretty one, and is of use when for instance, an opening occurs amid the trees behind the fisherman, and when such trees are within the radius of the back cast of his line, and when a loop or curved side cast

cannot be made. In casting backward in the ordinary overhead manner it is nearly always impossible for the fisherman to guide his line accurately, and were such an attempt made when the open space is small, the backward cast would result in the line and fly hitting the trees instead of being directed safely through them as described above.

The Galway cast can be best practised as a substitute for the ordinary overhead method of casting a fly backward and forward in one plane. When the Galway Cast is thus perfected it can be introduced into the Wye cast, and made directly after the lifting and side swing movement into the new plane of the latter cast has been made.

In Plate XXXII. the fisherman is raising his rod prior to turning. In Plate XXXIII. he has turned.

The time that a salmon line of thirty-five yards in length will take to extend itself after the conclusion of either the backward or the forward cast will be about one-and-a-half seconds, thus giving ample time for the forward turning movement I have described above to take place. A point which the fisherman should now remember is that he will have to make one whole turn in order to complete the Galway cast with the salmon rod, and that while making both the backward and the forward half turns, the rod—beyond being lifted in the plane in which it lies—has not to be moved to either side of that plane.

If it be desired to introduce the Galway variation of the back cast into the Wye cast movement, the rod is first lowered to the water downstream, and any slack line is gathered in with the left hand. The rod is then lifted to an angle of between fifty and seventy degrees (see Plate XXXII.), the body and rod sweep round until they are facing across stream in the direction in which the line has to fall, and the turning movement (Plate XXXIII.) of the Galway cast is then made, the back cast is finished

PLATE XLV.

THE LOOP CAST—ROD COMING FORWARD.

as above described, and the turning movement is again accomplished and the forward cast made.

Curved Casts

If the rod, and line attached to it, be held upright and its upper end by a continuous action moved round in a circle horizontally above the head, the line will follow the action of the point of the rod, and circle round in a continuous loop. The greater the force applied, the longer will be the line which can be made to follow the point of the rod, but directly a new movement of the rod is made the line will at once leave the circular curve in which it has been travelling, and will follow the direction which the point of the rod has taken. There must however, be no pause in the motion of the rod, the curved action must always be made in a steady swing, which is merged into a direct cast, towards the spot at which the line has to fall, and to which the body should be turned. If it be necessary or desirable to make any back cast in a circular manner, the circling backward movement should not be continued beyond the plane in which the forward cast has to be made, *i.e.*, directly the rod in its backward circling movement has arrived at a point immediately in a line with the desired direction, the movement, without its speed being checked, should be altered into the forward overhead cast in the desired direction. In the variation of the Wye cast mentioned on p. 337, diagram 22, such a horizontal sweep is made in the back cast, as the fly is lifted from the water. The principle by which this movement is affected is of the greatest value in making the loop, the switch, the Spey, or any curved casts. If the reader will turn to Chapter X. he will find these three casts exhaustively dealt with as regards the single handed trout rod, but containing theoretically all the principles which he will have to adopt when making these casts with the salmon

rod. I shall however again go over the casts as they should be made with the double handed rod.

If the position in which the fisherman stands with regard to natural or artificial dangers does not permit the extension of his line in a backward direction either in the overhead or the side casts he may still be able to extend it in front of him by making the Loop, the Switch or the Spey cast.

The Loop Cast made in one Plane

The cast which is known as the Loop cast is one in which a complete loop should be made with the line, and although the point of the rod does not describe so complete a circle as that taken by the line yet its whole movement is of a circular nature, which is directly responsible for this result.

The Loop cast may be considered as the parent cast of the Switch and the Spey casts.

We will assume that the fisherman is standing in such a position when he is fishing that he must bring the rod back more or less in a vertical plane, that his line and fly lie extended in front of him on the water and that he wishes to return them in the same plane, but that he cannot extend the line and fly more than a few feet behind him. The Loop cast should then be made as follows :—

The rod, when it is held with the right hand uppermost, is raised and brought back steadily until it is inclined at an angle of about twenty-two degrees behind and to the right of the shoulder. The line, following this movement, will be thus brought more or less to the surface and from there will run up to the rod point in a slight curve. (See Plate XLV.). This movement is then turned into a forward and downward switch.

In this Plate it will be noticed that the forward movement has commenced. The downward switch is made precisely as is the downward switch in the overhead cast, the action being finished well down.

The Loop from left to right—Salmon Rod

If the cast is properly made, a perfect loop will run along the water, finally extending the fly at the extreme end of the line. It will be seen from Plate XLV. that the line is being sent forward in the vertical plane.

In this cast it must be remembered that the rod has to be inclined a little to the right of the fisherman, and not brought directly behind him, or otherwise in his forward effort the loop—which has been extended slightly behind him—will in its forward course foul either his elbow or the rod in its downward action.

The Loop Cast made from Left to Right

This variation of the Loop cast bears a similar relationship to the Loop cast, that the Wye cast does to the Overhead cast.

We will assume that the fisherman is desirous of directing his fly out of one plane into another, and that in the first instance he is standing on a shelving bank, and, having fished out his cast, is desirous of sending his fly (which has drifted down stream to the left) towards the right and across stream. Assuming that his length of line is not greater than he can comfortably use, the rod is first raised vertically and brought backhandedly to the left, and to an angle of twenty-two degrees behind the left shoulder; while this is being done he should turn to the plane in which his fly has to be projected; he then makes his forward and downward switch as formerly described. Plate XLVI. will illustrate this variation of the Loop cast, and will show the curve made by the line; the disturbance on the water indicates the position from which the line has been picked up, and the curved line in the air shows the direction in which it has been projected. The fly will be noticed just leaving the water.

The Same Cast from Right to Left

We will now assume that the fisherman wishes to cast from the right towards the left hand. The rod is brought back in this cast to the right of the right shoulder, and to a similar backward angle, the body being turned as this is done, and the downward switch made as before. Plate XLVII. shows the loop as this cast is made. Either of these casts are (as explained on page 195) excellent substitutes for the "Spey Throw" and they can both be made with equal ease when the left hand is uppermost.

The Switch Cast

In the Switch cast it must be assumed that the fisherman is standing under a bridge, or under a tree, etc., that he cannot raise his rod to a greater angle than forty or fifty degrees above the horizon, and that he cannot extend his line to any distance upstream. He will therefore have to adopt a method of making his cast which bears a similar relationship to the Loop Cast that the Side Cast bears to the Overhead Cast.

We will suppose that the line and fly are extended down stream, and that the fisherman wishes to make a fresh cast somewhere in the same direction. His rod is first lifted in order to get the line well on the top of the water. It is then *drawn* back sideways through the same angle as that made by the rod in the side cast, continued upwards as far as circumstances will permit, and switched forward in the direction in which he wishes his fly to go. The first part, as is the case with the Loop and the Spey, must be made in one continuous action, and it is not until the forward and slightly downward portion of the motion has to be made that the switching impulse has to be given to the rod.

In every cast with the double handed rod it must not be forgotten that the dominant force in the backward and lifting

THE LOOP FROM RIGHT TO LEFT—SALMON ROD.

action is made through the upper hand, and that the dominant force in the forward and downward actions of the rod are made through the lower hand.

The Spey Throw

Those of my readers who have studied the instructions on the method of making the Loop, the Switch and the Spey casts with the single handed trout rod will find but little difficulty in applying those instructions in order to make the Spey throw with the double handed rod. It was generally supposed that in order to make this cast in the best possible manner one should have the advantage of at least three factors :—A rapid river, a long and heavy rod, a heavy line. Such factors, while they may aid this method of casting, and are generally characteristic of the salmon rods and lines used at the Spey side, cannot be claimed as being absolutely necessary for the Spey throw.

I have been coaching clients in this throw and its variations for over seven years, and I have had some of the finest fishermen in the world as my clients, also I notice in a recent article written by Mr. Marston that one of these clients has been able to extend his salmon line for a distance of over fifty yards, with a modification of the Spey throw, and Mr. Marston adds that this gentleman invariably fishes his dry fly in a similar method of casting.

I may then claim that my methods are practicable and that it must be evident that in the Spey throw, and in some of its variations, the fly and line can be projected as lightly as it can be thrown in the overhead method. Further than this, when once my method of casting a fly backward and forward in the overhead manner is acquired, any of my pupils can attain perfection in the Loop cast, the Switch cast or the Spey throw with the dry fly rod in from one or two additional one-hour lessons.

It will therefore be recognized that the difficulties which have hitherto overshadowed this useful cast need no longer deter the everyday fisherman from attempting to accomplish it.

The Spey throw with the salmon rod is a variation of the Loop and Switch casts, and when once the Spey throw is acquired—as in the Loop cast—in the right handed method, it can be immediately and correctly made in the left-handed method, that is to say, that when once my method of making any cast into a habit is acquired with the right hand uppermost on the rod, then it is possible to make this cast with the left hand uppermost and without any further instruction.

We will suppose that the fisherman is standing on the right bank of his river, that he has fished out his cast and that the line is now extended downstream under his own bank, but that he cannot make the ordinary Wye cast across stream, as there are trees behind him rendering any backward cast impossible. He will thus have to make the Spey throw, and in this case in the right hand manner. He first lowers his rod well to the water, taking in all the slack line between the fly and the top ring of his rod. He then raises his rod

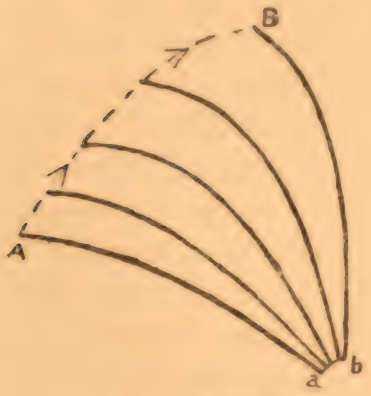


DIAGRAM 18.
Lifting the rod in the Spey throw.

DIAGRAM 19.
The up-stream swing.

THE SPEY THROW.

THE LINE EXTENDING ITSELF ACROSS THE STREAM AFTER THE DOWNWARD SWITCH OF THE SALMON ROD IN THE SPEY THROW.

NOTE THE DISTURBANCE OF THE LINE AS IT LEAVES THE WATER.

vertically in order to bring the line well to the surface of the water (see Diagram 18), at the same time also turning in the direction to which he wishes to cast his fly. He should then lower his rod towards the water again, and, without pausing, bring it up-stream with a steady motion, finishing this movement at an angle of twenty-two degrees to his right, as in the side cast (see Diagram 19). The line in this movement is not switched from the water, but is drawn along its surface, and at the conclusion of the side movement the rod is brought round and up in spiral curve as shown in Diagram 20, and is then switched

DIAGRAM 20.
The backward and upward swing

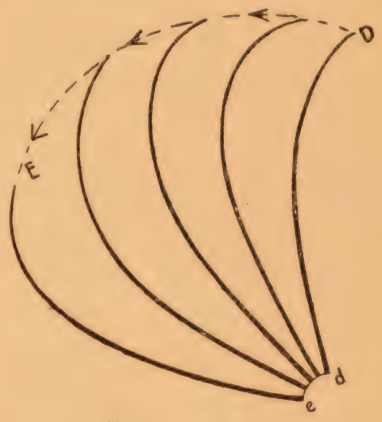


DIAGRAM 21.
The forward and downward switch of the rod.

THE SPEY THROW.

forward in the direction in which he wishes his fly to fall (see Diagram 21), taking care in the downward action that his rod does not come into collision with the line as it rises from the water.

If he be fishing with a considerable length of line out, instead of swinging his rod with a steady motion up-stream, sufficient switch should be given to this action to lift the line and fly from the water and to deposit them more or less on the surface of the water above the plane in which he is

going to cast, the rest of the motion being as before.

Plate XLVIII. shows the alteration of direction in this cast, the photographer having been able to get the line as it circles through the air.

In Plate XLIX. the photographer has taken the line at the moment after the up-stream switch has been made, and it will be noticed that the line has followed the raising of the rod as well as its up-stream motion, and is just beginning to extend itself behind the fisherman, who is in the act of finishing his turn toward the direction in which the fly has to go, the spiral and backward raising motion of the rod being just indicated. By the time he has completed his turn and swung his rod round behind him, a considerable portion of the line will have deposited itself on the water on his right hand side, and the remainder will be circling round and behind him. It will be seen that in this case no possible collision can take place between the line and the rod (see Plate XLVIII.).

The "Suir" Cast

With regard to the first variation of the Spey cast, it is difficult when fishing with a long line to make the downward switch across stream without fouling the line, and this has led to another very interesting variation of this useful cast.

When fishing the Suir river in the South of Ireland, the water bailiff of my host showed me a cast which effectually overcomes this danger of fouling the line. The fisherman in question could give no name to this cast, and so I have ventured to suggest a name for it myself—the "Suir" cast.

When it is desired to make a fresh cast across the stream, and when the backward switch cannot be made, the rod is lifted and brought up-stream as in the Spey cast. When the rod has reached its up-stream limit, instead of being

THE BACKWARD SWING OF THE SPEY THROW.

TURNING TOWARD THE DIRECTION IN WHICH THE FLY HAS TO TRAVEL.

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brought round, up and over, as described under the Spey cast, it is brought forward again down-stream, the butt resting against the hip, the hands are changed, and the left foot is advanced, the rod being then brought up and backward over the left shoulder immediately away from the direction in which the fly has to fall and the fly is then switched forward.

The whole of this movement is continuous, the rod being moved backward, forward, and up and over the left shoulder as steadily as a golf club should be raised, the acceleration forward into the downward switch commencing when the rod has reached an angle of about twenty-two degrees behind the vertical line of the body.

This cast is very easily acquired, and should be practised at first with a line from about twenty to twenty-five yards long.

I have never seen anyone using it, but I have found it extremely useful when a tree or branches on the up-stream side has prevented me from bringing the rod up, round and backward after the up-stream movement of the rod in the Spey cast.

This cast has this advantage—that more line is lifted from the water and brought up-stream, owing to the up-stream motion, than is the case in the left-handed loop cast.

A Variation of the Wye Cast when Danger is Behind

My reader will kindly imagine that we are fishing in Norway, and standing on the left bank of the Namsen River, below the Fiscum Foss. High above our heads we can see the river, broad as the Thames at Richmond, as it sweeps over the edge of the falls, and appreciate its immense volume of water as, thundering in our ears, shaking the rocks on which we stand, and covering us with spray, it plunges downwards a sheer 200 feet into the enormous salmon pool, which constitutes the end of the Namsen as a salmon river. If

you look across the water toward the pine-crowned cliffs, guarding the approach to the river on the opposite side, which run from the falls down stream to the bottom of the rapids, you will notice how the surface of the river, as it leaves the troubled waters of the head pool, is broken in its first smooth glide by an almost submerged brown and grey rock some thirty yards from that on which we are standing, and some twenty yards from the precipice opposite. There, at any time between May and September, resting after his journey from the sea, in the eddy of that rock, so long as it shows above water, will generally be found a good fish. If you can present your fly in an attractive manner, you will probably find him in a taking humour, and when happily you may be lucky enough to gaff him, and try the same cast over again later on, you will probably find another fish in his place.

You will see at once that you cannot cast for that salmon in any other position save from the jutting slippery and spray-drenched rock on which we stand ; and to make such a cast more difficult, twenty yards behind us rise the precipitous walls of the river channel, against the iron sides of which the overhead or side cast backward of the line will most assuredly bring your fly with disastrous effects.

To present your fly attractively, your cast should be sufficiently long to drop the fly three yards at least beyond the rock, so that it will then sweep round from the farther side, and appear just over the salmon's position.

This, however, means a fairly long throw, of thirty-three yards at least, and although you can shoot the line, it is still evident that the wall behind will preclude your extending the line in that direction for the remaining thirty yards.

We cannot use the Spey throw from our only standing-place, for you will see how those low-lying rocks run out into the stream below us, and our fly, in the up-stream drag of the Spey cast, would most assuredly come to grief among them.

The axiom that " the line must follow every motion of the point of the rod," suggests a way out of the difficulty. We must make a curved cast which is a variation of a Wye cast (see Plate XXXII.), and one which is most useful when fishing from a coracle.

The line, at the moment in which you make the forward cast, must not be extended backward, or the fly would hit the rocks behind, and therefore it must be curved at the moment of the forward cast and every portion of the line must be under the influence of a circular sweep.

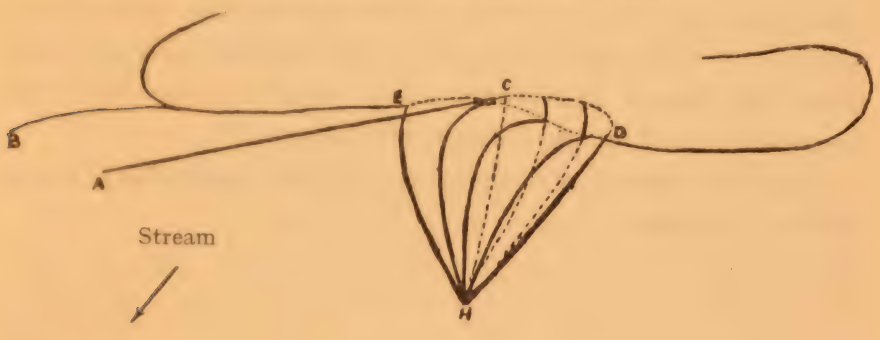


DIAGRAM 22.

H. The Pivot of the Rod Motion.
B. The Direction of the Rock.
C A. Shows the line as the rod is brought round in the upstream and backward curve.
C D. The upstream and backward curve of the rod tip.
E B. The line as it is extended forward.
H C, H D, and H E. The position of the rod as the cast is being made

The wind is up-stream from the left side, and this will help you in making the curl to the right. You have almost thirty-six yards of line extended down-stream and first lowering the rod point, you take in about four yards of line, and then proceed as in the Wye cast (see Chap. XV.) to lift your rod vertically, and then to bring it round in front of you to the right up-stream. You then curve it backward in a continuous sweep, and as the rod point

comes immediately behind you convert this movement into the forward switch in the direction of the rock (see Diagram 22).

The line following the path your rod has taken will confine itself to a more or less extended curve, and will, if the stroke is done properly, have avoided the dangerous face of the cliffs behind you. When the cast has been properly made, you will be rewarded by seeing your fly falling lightly on the far side of the rock, and may be, as I have seen, a fish plunging upward, and then downward, with your fly in his mouth. You will feel the ecstatic and electric thrill as the first strain of the salmon comes on your line, and thank Providence that your fly has not been snapped in half by the rocks behind you.

The Suir River cast described above would be a useful one in this case.

CHAPTER XVIII

THE SALMON FLY VERSUS THE SPINNING LURE, AND SOME RECORD TAKES

The salmon fly and the spinning lure—Colour of fly—Size of lures—The number of hooks on a lure—Advantages of the spinning lure—The selection of a salmon lure—The Welsh Wye—Some record takes of salmon—British Isles—Another record—A fifty-pound salmon.

The Salmon Fly and The Spinning Lure

The correct solution of the problem as to the appetite or otherwise of the salmon when in fresh water should have a very decided influence on the selection of flies with which they are to be tempted. If it be an appetite which induces the pursuit of the lure, then the desire of the fish will have to be considered as an important factor, and the fly to be used should be one which, when it is cast in the particular water to be fished, appears in the guise of the most familiar and best-liked food upon which the salmon has most recently been feeding. The great difficulty, however, which will beset the fisherman is that, among the extraordinary variety of lures presented to the salmon, there are but few which can be claimed as favouring the appearance of any well-known or favourite food of the salmon, and he will, therefore, be obliged to depend on the experience gained in the particular locality in which he is fishing for the most likely fly to use. If, on the other hand, it may be (as I advance) that destruction is the motive which induces the pursuit of a moving object by the salmon, then the particular colour, size, and shape should be selected which will most readily

and naturally attract the attention and excite this destructive impulse of the salmon.

Colour of Fly

It is recognized that certain peculiarities of colour attract the attention of the salmon more in some rivers than in others, although the natural life existing in the different waters is identically the same.

It has occurred to me that this partiality by the salmon for certain colours in certain streams may be due to the different effects produced on the subaqueous appearance of water life, by the geological strata of the country affecting the bed and the banks of the river, the natural differences of the foliage and the vegetation through which it passes, and its altitude above the sea. The effects of cloud and sunshine, clear or thick water, sunlight or shade, reflection or shadow, depths or shallows, spring or autumn, rapid or slow current, will all be varied by the above factors, and natural phenomena will, therefore, tend to alter at least the appearance, if not the colour, of the subaqueous life in different waters. Whatever purpose the salmon has in his pursuit of a moving object, it is certain that unless scared by former experience, he will most readily attack the object which has the most natural appearance and movement.

As the ever-varying influences of natural and meteorological phenomena will affect the colour of moving objects, as hunger may not cause the attack of the fish, and as destruction, from whatever cause it arises, certainly *is* the result, the colour of the lure appears to be secondary in importance to its having a natural movement and being of a moderate size, and the latter factors should therefore, in my opinion, be the basis dominating the appearance of the lure which should be chosen.

On page 348 will be found a letter from Captain De Winton the happy possessor of one of the best stretches of salmon water in Great Britain, the Nyth, situated some eight miles below Builth, on the Wye.

The successful fly used by Captain De Winton, when making his wonderful spring record of 308 pounds of salmon in one day, was the " Thunder and Lightning."

This particular stretch of water cuts its way in a succession of runs, rapids, and most promising salmon pools through the Silurian slate of this part of Wales. The country on both banks is high and well-wooded, and the bottom of the river is dark and rocky. Hence, if one had to choose a fly which would harmonize with the character of this part of the river, one could not make a better selection than the " Thunder and Lightning." This fly is generally recommended and is a favourite of my own when fishing those Welsh rivers which possess similar characteristics to those of the Wye in the neighbourhood of the Nyth fishing.

Some idea of the colouring of the river is shown in Plate L, this part of the river, Lady Alexander Paget's water, being about a mile from Captain De Winton's Nyth.

The letter from Her Grace, the Duchess of Bedford, on page 351, shows that her successful fly, the " Black Dog," was also one of a dark colouring, and that the River Tay, as shown in the background of Plate LI. possesses some of the dark characteristics of the Wye.

The favourite flies used on each river should always be tried, especially when fish are " running." Custom may, however, stale their infinite variety to fish which have been some time in the river, and in any particular pool, and thus patterns which are not usually fished on such streams should be tried, and will often be found effective.

When fishing with a minnow as with the fly each cast should be fished right out. A fish will often follow the lure

right up to within a few yards of the fisherman, and should a sudden increase in speed be made at the last moment it will frequently lead to an eager rush and a hooked fish.

Although I now use only the fly or spinning bait I quite sympathize with the man who first tries the fly, then the minnow, the spoon, the prawn, and the shrimp, and finally succeeds in capturing his fish with a bunch of worms.

Size of Lure

The advisability of varying the size of the lures offered to the salmon must be evident, when it is remembered that salmon are caught with the small trout flies, fly spoons and with the smallest minnows, and the fisherman should always remember that the farther from salt water, the finer and lower the water in the river he is fishing, the finer should be his traces and the smaller his lures; a brown-coloured shrimp, well sunk, is for this reason one of the most effective lures in dead low water. The one drawback however to using the finer lures is the difficulty of killing with them, as the rod, the line and the cast, with which these are fished, have to be proportionately delicate; but when fish are hooked under such conditions the odds are exciting enough to please most people, and the use of such fine lures is frequently the only method of obtaining sport.

The Number of Hooks on a Lure

If only the natural or artificial minnow or spoon were used with but a single hook, instead of two or more flights of triangles, the minnow would be in every way as sporting a lure as the fly, and, both in salmon and trout waters, a minnow armed with a single hook would give far greater sport, injure and scare far fewer fish, and lead to a more equal distribution of catches from the sea to the spawning beds. A salmon whose mouth has been lacerated by triangles

in the lower reaches is apt to become rather shy by the time he arrives at the upper part of the river.

Fly Fishing *versus* Spinning

Under the best circumstances, when the water is in good condition, and fish fresh run and plentiful, fly fishing is by far the most enjoyable method of angling for salmon. The satisfaction is greater and the sporting chances of the fight more evenly divided than when using a spinning lure, but unless the action of the fly fisher's rod be exactly suited to the muscles of the fisherman, and sport be good, the skilful performer with the spinning rod may find in spinning not only the most effective, but the more fascinating method of fishing.

After the capture of the first few salmon, and when the sport has lost some of its novelty, the fisherman will frequently have to exercise the greatest patience and perseverance, in order to continue casting his fly with that care and attention which is necessary in order to be successful.

As the hours lengthen into days, and as the days sometimes lengthen into weeks—ere the fisherman's labour is repaid by the capture of a salmon—unless he be gifted with the patience and perseverance which are so necessary, he will in all probability find the pastime of fly fishing for salmon becoming somewhat wearisome.

If for instance, he should have a temperament so happy as to enable him to place the most absolute faith in the particular fly he happens to be fishing with, he will, at every cast he makes, expect a salmon to accept his lure ; but if not so happily endowed, it will be almost impossible not to lose faith in the immediate efficacy of the one, two, three or more flies which have been tried for some hours without success.

Advantages of the Spinning Lure

As there must be about at least a hundred different kinds of salmon flies, each one of which is more or less individually recommended, it becomes increasingly difficult to place faith in any particular fly after it and several others have been selected, tried and proved failures; patient perseverance is required—perseverance in continuing to make the best possible cast each time, and patience as regards the faith placed in the lure which you happen to be using. This is the reason, I take it, that the average man, under average circumstances, when he can spin properly, prefers spinning to fly fishing. Spinning lures do not vary to the same extent as do salmon flies, and there are always one or two best spinning lures on any river, and almost invariably one special lure in which the fisherman can place his faith, without calling upon his patience to aid him in doing so.

Each individual cast with a spinning lure, no matter how many times it is repeated, may therefore be made with confident expectation that, if a salmon is in the pool and is inclined to take, the lure which the fisherman is then using is the best one for the purpose.

Personally, I cannot always pin my faith to a special salmon fly, for I have found so many which, while they have been successful on certain days, are absolutely failures at other times, and after a series of unsuccessful casts have been made in those pools most likely to hold a salmon, I have always to make a mental effort to inspire myself with that confidence in the fly I am using which makes salmon fly fishing such a pleasant exercise.

One of the factors which tends to make spinning interesting is that attention, which creates interest, must be paid to the spinning lure after it has entered the water and until it is again lifted out—because, unless carefully spun, it will sink to the bottom, and run foul of weeds, snags or other dangers.

Fly fishing for salmon differs from spinning only in the method by which the lure is presented to the fish, and were it not for the fact that the spoon or minnow bristles with an armament of triangles, the sporting elements of the two methods—spinning and fly fishing—would be identical.

As regards the relative disturbance made when fly fishing and when casting a spinning lure *over* a pool, there is, if anything, less made by the latter than by the former method, for although the spinning lure alights with a greater splash than the fly, the reverse is the case when we come to consider the commotion made by the lines which are respectively used in the two methods. The tapered salmon line used in fly fishing undoubtedly falls with a much heavier splash than a spinning line, and it makes a commotion when it is picked off the water which is entirely absent when spinning is adopted.

The Selection of a Salmon Lure

Beyond the experience of the local fisherman as to the most killing fly for the hour on his own water, there are, so far as my experience goes, no definitely known means of determining the salmon fly or even the lure which will be the successful one with which to fish, and therefore if the right one be chosen it may well be considered a matter for congratulation.

When Dry Fly Fishing for trout there are always certain indications which will guide the fisherman in making a correct choice of the one and only fly which will prove successful; but when salmon fishing, beyond the experience that riverside knowledge may impart, or that local experience claims—no definite means of ascertaining which will prove the successful lure have yet been suggested.

There may and may not be some sound reason, and possibly some well-considered experience, on which the

views of local fishermen are based, but many varieties of flies, or other lures, used on any particular river have come into favour because they have been those used by the most successful of the local fishermen. Other flies, or other lures, are either not tried at all, or not until the more favourite flies and lures have proved unavailing, and they are for that reason often condemned because the mind has already decided that the salmon are untakable, and the faith and its attendant perseverance which alone bring success, have not been exercised when fishing with them.

On certain portions of the Wye, for instance, it is generally believed—and this belief consequently influences the choice of the fishing lure—that spinning bait can be used in the spring to far greater advantage than the fly, and the fly in autumn to greater advantage than the minnow. Yet I have on more than one occasion proved that such a rule is better honoured in the breach than in its observance, and that the minnow at times in the autumn is equally as killing as the fly, if not even more so. Variations in the killing properties of any particular kind of lure generally follow any pronounced meteorological disturbance.

In the autumn of 1912, when fishing on the Wye below Builth, my hostess, who was using a fly, caught three salmon on the lower part of the upper pool of her water between 10.30 and 12 o'clock, while I, who had been fishing the upper part of the same pool with an artificial minnow, had not had a touch. Finding that the salmon were no longer coming to the fly of my hostess, I moved down at noon, and fished the lower part of the pool with my minnow, and with this lure I killed three salmon before one o'clock. Plate L. shows Macdonald, the gillie, gaffing one of the salmon taken on the fly.

But while the nature of the lure may be varied with conspicuous success during the day, the following advice

ON THE WYE.

GAFFING A 20-POUNDER.

should be remembered—"The finer the water, the finer the lure."

Compel yourself to believe that, during the time you are using it, the lure with which you are fishing must be successful.

I have found, in the majority of rivers I have fished, that after any spate the minnow and the fly may at any time of the year be used, and apparently with equal chance of success.

Consider and act on local advice in your selection of lures, but directly you find them failures act on your own initiative, use your own judgment, and be guided by former successful experience.

The Welsh Wye

It is with pleasure I now give two letters from well-known and experienced fishermen, which should be carefully considered by my readers. These letters deal with the Welsh Wye, which to me is certainly the most interesting salmon river in the world. In one, if not the most beautiful of its stretches, I caught from a coracle my first salmon, a fifteen pound spring fish, with which I effected a union just above Bannerman's Inn, and which I landed at the bend below the Symonds Yat rapids. The fortunes of this beautiful river I have followed since childhood with unabated confidence in its ultimate popularity. A former Chairman of the Wye Board of Conservators, to whom I think the Wye owes so much, J. L. Hotchkiss, Esq., was one of the first whom I had the pleasure of coaching in casting a salmon fly, and since then very many of those who fish on this particular river have been instructed by me in fly-casting and spinning, and my predictions that ultimately the river of my youth would rank, if not as the best, at least as one of the first rivers for salmon fishing in the United Kingdom, has been fulfilled.

According to the Wye Board of Conservators 3,538 salmon, averaging 17 lbs. 6 ozs. were caught with the rod on the Wye during the season 1913 (while 6,408 salmon, weighing 83,686 lbs. were caught in the nets during the same year). The largest fish weighed 47¾ lbs., the best day's take to the individual rod being that of Captain de Winton, viz., 17 fish averaging over 18 lbs. each and weighing in all 309 lbs. Captain de Winton writes as follows:

"Maesllwch Castle, Glasbury, Hereford.
21st November, 1913.

"DEAR MR. SHAW,—In answer to your letter *re* my big day's salmon fishing on the Wye, the weight of fish was 309 pounds and number 17. Although I don't care about records myself, I believe from what the editor of *The Field* wrote to me, that the weight is a record for *spring* fishing, but not for autumn fishing. In fact I know two people myself who have killed a greater number of fish in the day, but in each case, the weight was no comparison.

"I only used two flies, both tied by myself, a No. 1 Thunder and Lightning, double hook, and a ditto size No. 4. I killed twelve fish on the former size, and five on the latter; both flies none the worse, so an amateur can tie flies to last sometimes.

"In answer to your question as to the best lures on the Wye, in my part of the river I say without any hesitation that one will kill more fish by sticking to a fly than by any other method. However, to get the best out of a fly one has to know one's water thoroughly and absolutely, so as to use the right size of fly; *about* the right size is no good.

"As to colour, I do believe very much in the colour of the *body* and hackle, but not in minuteness of colour.

"With regard to the wing, I don't care a button what is in it, so long as there is very little of it. We use this lure from 7/0 Dee Hooks down to No. 8 and No. 10 trout flies.

"People, as a rule, will not have a salmon fly unless it is a thing of beauty to start with at any rate, and the more they get for their money, especially in the wing, the better they are pleased. They may be right. All I know is that I myself will not use a thick winged fly, and generally cut about half the feathers out of a shop tied one.

"Lower down the Wye, the water is not good fly water, and a lot of fish are caught, in fact all, I believe, with an artificial minnow.

"I am afraid I have not got a Kodak of my seventeen fish, it was so dark the following day, that they could not be taken unfortunately, or else you should have one with pleasure.

"On my particular day, I may say, in case it interests you, that I only actually played one other fish—the tenth hooked—and if I remember rightly just touched three others. It was all done between 10 a.m. and 5 p.m., on half a mile of water.

"With regard to what you say about salmon taking a March Brown, I may say that on this river it is on the whole, day in and day out, about the best fly you can put on in sizes 7 and 8. Anyhow, in those sizes, a March Brown and a Thunder and Lightning are my favourites. Of course, one uses the latter fly in all sizes up to 5/0 and it is equally good in all.

"I am, yours very truly,

"ARTHUR DE WINTON."

Mr. J. Arthur Hutton, the well-known authority on the scale markings of salmon, wrote to the author as follows:

"*21st November*, 1913.

"DEAR SIR,—In reply to your letter, it is quite impossible to lay down a hard and fast rule as to the use of the fly and minnow, but I am quite sure a good many fishermen, through their prejudices against spinning, lose many chances of catching salmon. I

know a great deal of this prejudice is caused by the fact that the number of anglers who are able to use the spinning reel effectively are comparatively few.

" In the upper part of the Wye I believe the biggest portion of the fish are caught with the fly, though there are also some experts with the worm, but in the middle and the lower waters, where the water is more sluggish, the fly is not of very much use in the early part of the year, and I should say until the end of March five fish are killed with the minnow for every one with the fly. In April, the fly will begin to catch up to the minnow, and in May, I should think quite as many are killed with the fly as the minnow, and after that the fly is far away the best bait.

" A great deal depends on the height and temperature of the water. I think, when the water is very cold, fish lying in deep water are not very much inclined to rise to the surface, and of course when the water is high, as a rule, it is hardly clear enough for a fish lying in say eight or ten feet of water to see a fly on the surface.

" Yours faithfully,

" J. Arthur Hutton."

Some Record Takes of Salmon—British Isles

Among the most noticeable catches of salmon with the fly, and forming a record, which, in my opinion stands alone as a sporting triumph, should be mentioned the magnificent two days—April 2nd and April 5th, 1913, on the Tay, by Her Grace, the Duchess of Bedford, which certainly will stand as a record for a lady's rod. No better take for two almost consecutive days has ever been made by a lady, and there have been but few better records for any one day. Plate LI. gives a picture of Her Grace, the fish and the Tay, and the following letter will give interesting details of how the fish were killed. It will show, as does the letter

of Captain de Winton (page 348), the value of a fly, and of using one whose colour partakes of the character of the bottom and surroundings of the river which is being fished. At the particular part of the Tay referred to the pebbles and boulders lying in the channel of the river are more or less covered with a dark weed. Plate LI. also shows the wooded nature of the banks.

These letters again are interesting as they show the remarkable difference in the manner salmon will attack the lure. In some cases, a whole day may be lost with a series of plucks at the lure by the salmon, which seem to be almost equivalent to the "coming short" of a trout. At other times, every pluck almost invariably means a hooked fish. In Captain de Winton's record, only three fish failed to take hold properly, but the Duchess of Bedford mentions that on her first day the salmon repeatedly failed to take hold of her fly in a satisfactory manner.

If only four fish out of the many who failed to take the fly properly on the first day, had secured a hold, Her Grace's record would have been equal in number to Captain de Winton's record on the Wye.

"*November 9th*, 1913.

"DEAR SIR,

"There were two days on which I landed thirteen salmon last spring, and, as generally happens, the one least written and talked about was the best.

"The first day, April 2nd, they were taking very short, and fish after fish dropped off directly it had spun the reel out. I finished the day very depressed, as instead of thirteen, I felt I ought to have had at least twenty, though I honestly don't think it was my fault. On the 5th, I again landed thirteen fish, and I think I only had two other rises. The first thirteen weighed 191½ pounds, those on the 5th, 191 pounds.

"April 2nd.—6½, 9, 7½, 10, 19, 16½, 19, 15, 22, 16, 13, 22, and 17 pounds.

"April 5th.—13, 18, 11, 10½, 10, 14, 22½, 23, 16, 13, 17½, 14, and 8½ pounds.

"The whole of the above were taken casting from the boat, and all but three on the "Black Dog." They were caught at Stanley, I forget what the pools were called, but I think Pitlochry and Washing Pools. Below the pool is a big rush of water, which the boat cannot go down, but down which it is always supposed that the fish will escape. The banks are high and wooded. The pool is not dark, but the sun goes off it fairly early.

"My rod is an eighteen foot one.

"I landed 102 fish in 23 days' fishing, *all casting*, total weight 1,503¼ pounds, largest fish 29 pounds, 18 of these weighed 20 pounds and over, and 51 weighed 16 pounds and over. I had three blank days between 21st March and 29th April. I can send you a photograph when I get back to Woburn in about ten days' time. (See plate LI.)

"I should probably not have made these good catches but for my lessons in casting,* and a hint I helped myself to when watching a very well known angler, Sir H. Maxwell. After making his cast he slipped the handle of the rod back so that the rod balanced evenly. Oh! the exhaustion this has saved me. When I asked him to improve my casting, by giving me hints, he said he could not teach me anything, but the hint I stole just made all the difference in a long day's casting, in fact made it possible for me.

"Yours truly,

"M. Bedford."

Another Record

When staying with Mr. Arthur Millington Naylor in 1897, as a fellow-guest of Mr. George Beck, he told me

* This remark is a kind reference to the Author's coaching.

ON THE TAY.

A RECORD DAY'S SPRING FISHING WITH THE SALMON FLY.

after a hard day's elk stalking in the Namsen Lake country, the following particulars of his record catch of salmon, which bear directly on the possibility of taking fish when every circumstance seems to be against you, and also on the fact that salmon will " feed " whenever they enter any new stretch of water on their up-stream journey.

This cannot be attributed to that exhaustion which is considered by many fishermen to account for the resuscitation—for recuperative purposes—of the feeding instincts of the salmon, for in this instance the run was only a distance of one mile, and their already decreasing appetites would still have been on the wane ; but the destructive instinct seems to me to offer a more feasible explanation of the freedom with which they took the lures.

Mr. Naylor, with Messrs. Hansard and Probyn, had taken the fishing on the Grimersta River, on the island of Lewis, N.B. ; but, owing to drought, the salmon could not run to the upper water and the lochs. The river between these lochs and the sea was " vera sma'," while seaward at the mouth of the river an immense number of salmon had collected ; some of these fish seen from the shore appeared to be developing some disease on the head and body—fungus-like white patches beginning to show themselves—while large numbers were found dead at low-tide. It was seen that unless rain came, the chances of the fish " running up " were nil.

It occurred to the party that in order to get the fish to run and to save their lives (*sic*), it was necessary to deepen the channel of the river as it left Loch Langlabat —the head loch of the river, and situated about nine miles from the sea—and that if a dam was made below the first of the four smaller lochs—which was about 100 acres in extent, and within one mile of salt water—a spate could be engineered which would bring the fish up to the first loch.

Labourers were obtained, and every one setting to work with a will, the upper channel was deepened and the outlet from the lowest lake was checked by a substantial earth-work dam, which—after bringing the water in it to about one foot above its former level—was suddenly destroyed, and an artificial spate created, which went tumbling down the short lower length of the river and into the salt water in which the salmon had been so long waiting. The result was an immediate run of salmon to the lake above, where they remained for some weeks.

It was permissible to fish only one rod per day on the first beat, which included the first loch in which the fish had collected. The total take for the six days at the end of August following this artificial spate was 338 salmon and 71 sea trout, the average weight of the fish being 6 pounds.

On the 23rd of August Mr. Naylor killed thirty-one salmon, on the 27th the rod which fished the loch got thirty-six salmon. On the 28th Mr. Naylor had the record catch, taking fifty-four salmon in nine hours, and Mr. Hansard caught forty-six fish the succeeding day; the next day again, the 30th, Mr. Naylor killed forty-five salmon, all these wonderful records being made with the fly.

No record was made of the salmon lost or which came "at" the fly during these busy days, and but little wonder can be felt at this, for when a man has an average kill of one salmon to every ten minutes throughout nine hours' fishing, he has little time for other matters. The record is in itself a wonderful instance of endurance.

A 50-Pound Salmon

It might, perhaps, illustrate the uncertainty of salmon fishing and the reward which will at times repay a patient

wait on the river-side if I describe the good luck which attended my enforced stay on the Namsen River at the end of the 1897 season. The late Mr. Merthyr Guest had very kindly placed his house at Gartland, and his stretch of the Namsen River, at my disposal. I had been entertaining a party of my friends, who, owing to previous English engagements had one by one left me, and on the 23rd of August I found myself alone, to settle with the servants, and see that the house was properly closed for the winter. I had arranged to follow two of the party further into the interior and join them in elk shooting.

On the very night, the 23rd, on which these two visitors left Gartland, a heavy downpour of rain commenced, which made their journey up-country extremely unpleasant, but which brought down the Namsen River in spate.

On the 26th of August the river was fishable, and I was lucky enough to kill over 200 pounds weight of salmon; on the first day, among a lot of other fine fish, I obtained one which scaled just over 50 pounds. This was a fine old cock fish, which, had he been fresh-run, would probably have scaled 60 pounds. He was killed at 5 p.m. on August 26th.

This splendid salmon measured exactly 4 feet in length, 27 inches in girth, and the span of his tail was 13½ inches, and he had the biggest head I have ever seen on a salmon. He was hooked shortly after four on a medium-sized spoon with a 17-feet greenheart rod. He took the lure with a tremendous dash, the reel screaming as the fish went spinning down-stream; but, luckily for my nerves, he gave me a chance after taking out 100 yards of line, and I was able to turn him towards the bank. After trying a short run up-stream, he made another dash towards the centre of the river, and then another down-stream rush, until he sulked in about ten feet of running water. Pulling

in to land, I attempted to move him ; but for fifteen minutes he lay like a rock, sulking, if ever a fish sulked, and only a surge now and again told me I had a fish, and not a world, on my line. I might have turned him down-stream, but my Norwegian strongly advised me not to do so, as danger existed but a short distance below. So it was a case of wait.

Meanwhile, my eyes were beginning to play me tricks : the high pine-clad banks commenced running up-stream at express rates, whenever I lifted my eyes from the rapidly running river at the spot where my fish lay, and on turning them on any motionless object, the same curious optical delusion occurred. My gillie, Isaac, now planted a stone or two below the salmon, and after fifteen minutes' sulk, he made a move up-stream, and then a dash across the river, we having to follow in the boat for some 300 yards. He then came down again and we got him into a big back-water, in which I managed to keep him, and finally, after a very anxious struggle, we had him beautifully gaffed, and lying on the bank.

He took forty-five minutes to kill, and out of that time he sulked for fifteen minutes among some dangerous rocks in a deep run, about 70 yards from the bank on which we finally landed him. I also killed two fish over 30 pounds with the fly (Jock Scott and Popham), besides losing another very big one, and finished off the day by killing a 22-pound clean-run salmon with many sea-lice on him. It was a coincidence that Mr. Guest should have killed in the same pool, on July 20th, 1894, a 64-pound salmon, the length of which was 4 feet 3½ inches, but with all other measurements similar to the one just described. Mr. Guest's fish was almost the biggest salmon killed on a rod at that time.

I killed on this water, in the preceding year, on September

10th, 1896, a clean-run salmon of 24 pounds. This will serve to show that this river has every chance of giving good sport until the close of the season, provided always that the rain is forthcoming, or that there is sufficient water in the river to bring the fish up.

CHAPTER XIX

THE SPINNING REEL AND THE SCIENCE OF SPINNING WITH A SALMON OR ANY DOUBLE-HANDED ROD

The consideration of a spinning lure—The spinning reel—The drum, its inertia and its rotation—Determining the moment for free rotation—The control over the drum—Checking the rotation of the drum—Diagrammatic consideration of spinning with any make of the Nottingham reel—The check on the drum—The automatic starting mechanism of the drum of spinning reels—The right side cast with the double-handed spinning rod—The starting point—The action of the rod.

The Consideration of Spinning a Lure

The difficulty of learning to cast a spinning lure correctly and accurately has been in the past greatly increased owing to the fact that there never have been, so far as I am aware, any definite instructions as to the exact nature of the physical energy required in spinning, or as to how that energy should be scientifically applied.

The art of spinning consists in propelling a lure accurately and delicately from the end of a spinning rod, and the mental and muscular action which is necessary to make this a correct habit is not easy to acquire. It is necessary that a well-considered and practised manipulation of the reel and the line to which the lure is attached should accompany this action.

As no two absolutely new actions can be thought out and performed together—one or other of these two separate mental and physical processes must be learnt first. The attempt to accomplish them simultaneously will result in failure, and a continuance of this attempt, though it may

ultimately result in success, will be a long and tedious process, in which one of the objects to be achieved will have to suffer until the other has been acquired, and even if success attends the simultaneous efforts, those efforts, when made into a habit, will only be acquired as a knack.

If the separate process of manipulating the reel be first considered and practised until the correct method of using it be made into a habit, which answers to *desire*—then the other original process, the manipulation of the rod, can be considered, practised and also made into a correct habit.

It will then be possible to consider and perform the two actions of using the spinning rod and the spinning reel together.

It must be evident that the simpler the manipulation of the reel, the more quickly can it be learnt, and the use of the rod be thereafter acquired. No reel should take more than two minutes to learn, more than five minutes to handle, or more than half an hour to work habitually. The greater difficulty is in learning the correct manner of using the rod.

The Spinning Reel

We will turn first to the reel. There are three different duties required from the mechanism of the perfect reel :—

1. Its normal duty—this consists in its working as an ordinary fishing reel. The rotation of the drum on which the line is wound is held in check by a ratchet wheel and a spring controlled pawl. Their united duties are to so effect the control of the drum, that in one direction of its rotation it presents its strongest resistance to the fish, and in the other a considerably less resistance to the hand when winding in the line.
2. Its second duty is the permitting of the disengagement of the pawl from the ratchet wheel and the free rotatory action of the drum.

3. Its third duty is allowing so gentle a braking action to be applied to the drum that while it does not impede the unwinding of the line, and the progress of the lure, yet it prevents the drum from overrunning the line.

In the most perfect form of a spinning reel* the first duty is being performed when the reel is in its normal condition.

The second duty is brought into being by a slight and continued pressure of a finger of either hand.

The third duty is brought into being by an increase in this pressure, and the normal duty again arrived at by releasing this pressure altogether.

It will be recognized that these three duties of the reel should be determined by the most simple and easily acquired action possible.

The Drum, its Inertia, and its Rotation

The various influences which affect a spinning lure during its flight through the air, even if ascertainable, could only be considered as affecting the lure at the particular moment at which these forces were definitely known.

It is certain that one cannot solve a problem when the different factors connected with that proposition are of an unknown and ever varying character, and therefore a general formula to determine the exact speed, curvature, and position of the lure at each moment of its passage from its place of inertia to that of its destination—during the act of spinning—cannot be stated.

If the lure at a certain moment of its radial passage were permitted entire freedom, centrifugal force would exactly determine its pathway, but the lure is attached by a line to the drum of the reel, and therefore it is only partially released. Hence a series of different factors come into

* See the description of Spinning Reels in the final chapter.

play, and influence the onward motion of the lure after the drum on which the line is wound has been released from the controlling influence of the pawl and ratchet mechanism of the reel.

The principal factors which operate on the spinning lure when the drum is released, and which offer a retarding and guiding influence to its passage are as follows :—

(1) The varying influences of gravity.

(2) The varying friction of the drum in retarding the extension of the line.

(3) The varying frictional resistance of the air to the passage of the lure and to the line.

(4) The varying frictional resistance of the top rod ring to the passage of the line.

That these influences must vary will be gathered from the following particulars :—

(1) The action of gravity on a moving body whose velocity is unknown cannot be calculated.

(2) The rotation of the drum starts from inertia—which has to be overcome. Its speed then has to be checked in order to prevent its over-running the line, and finally its revolutions have to be stopped as the lure enters the water.

(3) This varies according to the meteorological conditions of the moment, varies also according to the length and curvature of the line, the speed and curvature of the lure through the air, and the condition—wet or dry—of the line.

(4) The frictional resistance offered by the top ring of the rod to the line varies in regard to the direction in which it is extended, and in which the rod is held.

Now a consideration of this problem, connected as it is with so many and so varying a series of influences, all bearing on the flight of a spinning lure, must obviously be impossible

when actually spinning, and therefore a practical method by which the accurate casting of a spinning lure can be accomplished will be found useful.

Determining the Moment for Free Rotation

Presuming that the fisherman's method of swinging his spinning rod be perfect, he has only to determine correctly the moment at which he has to permit his lure to leave the controlling influences of his pawl mechanism, *i.e.*, the exact angle during the radial swing of his rod at which the check on the drum of his reel has to be withdrawn—in order to insure the accuracy of his casting.

If, then, a trial cast be made when spinning a lure with a certain length and make of rod, a certain frictional resistance to the rotatory action of the drum of the reel, a certain weight of lure, and to a certain distance, and the lure arrives at its destination, it will be evidence that the drum has been released at the right moment, and that so long as the same rod, line, reel, and lure be used, and a similar force be applied by the fisherman, this particular angle of release which has effected the correct course of the lure will also have to remain constant.

If, however, in a right hand cast, that is when the cast is made by swinging the rod from right to left, the lure has fallen to the left of the mark aimed at, it will be evident that the drum has been given its freedom too late. If, on the contrary, the lure has fallen to the right hand of the mark aimed at, it will be evident that the drum has been released too soon, and with the information thus gained it only needs one or two carefully calculated casts to determine the exact angle—during the swing of the rod—at which the drum has to be released in order to obtain the accuracy necessary in casting the lure with the rod from this spinning reel.

The Control over the Drum

When a perfectly regulated spinning reel is used when casting, the centifrugal force acquired by the lure should not overcome the spring controlling the rotatory action of the drum, and the lure, therefore, after reaching the position L^6, Diagram 23, would continue to circle round concentrically in line with the rod top, so long as the forward motion of the rod is not varied (see K.K.K., Diagram 23, page 365).

It is obvious that if the lure has to leave this circle in order to reach some desired place on the river, lake, etc., it will have to be released from the controlling action of the drum. A free rotation of the drum is therefore necessary if the lure is to proceed to its destination. Directly the drum is allowed to rotate the centrifugal force hitherto kept in check will cause the lure to fly off at a tangent to the circle in which it has been travelling (see L^6Q, Diagram 23).

The frictional resistance of the air to the line, etc., will gradually affect the speed of the lure and also the amount of the line which is being drawn out, but the rotatory velocity which the drum of the reel has acquired will not be so readily affected, and unless it be checked it will eventually overtake the line which is being less quickly pulled from the cylinder, and thus cause over-running.

It is necessary, therefore that the drum should be again controlled, so that its rotatory velocity shall not exceed the rate at which the line is being drawn off by the reel. Now, this check to the drum of the original Nottingham reel was effected by the application of the hand, a finger of which was pressed to the side or edge of the rotating drum in order to check when necessary its excessive rotation, but not otherwise to interfere with its freedom or cause any sudden or unnecessary check to the progress of the lure.

Checking the Rotation of the Drum

No definite moment can be fixed at which to check the excessive rotation of the drum, but as a rule, the greater the curve made by the lure after its release from radial control, the sooner should the checking action be applied. When using a Nottingham reel and when the finger check has been applied, it can, if it prejudicially affects the accuracy of the cast or the progress of the lure, be again released. If, while the cast is being made, the lure is released from its radial control at too early a moment it will fly off too much to the right of the fisherman, and the sooner therefore the rotatory action of the drum comes again under control, the sooner will the direction taken by the lure be affected and its direction altered towards the mark at which it has been aimed.

It is evident, therefore, that any permanent or continuous braking action of this nature is not required, and a reel which is so constructed that it is necessary for the majority of those who use it to apply a mechanism which enforces a constant braking action to the rotatory velocity of the drum must be wrong in principle, for the drum when it is first released should have the greatest possible freedom of rotation, and any permanent check must retard the free rotation of the drum and add unnecessary resistance to the speed of the lure, and so lose the advantages of a freely rotating drum.*

Any mechanical checking influence on a drum should be definitely limited to that which is just necessary, and so arranged that it can be taken off or put on at pleasure during the time the lure is travelling to its destination. It is obvious that the slightest excess will unnecessarily check the progress of the lure, and a still greater check suddenly applied will be fatal to the success of the cast.

* See the description of Spinning Reels in final chapter.

Also it must be evident that unless such a delicate checking influence can be placed by means of a lever action on or off the drum at any moment desired by the fisherman, the delicate action of the forefinger directly applied to the rotatory drum, as on the original Nottingham reel, is preferable.

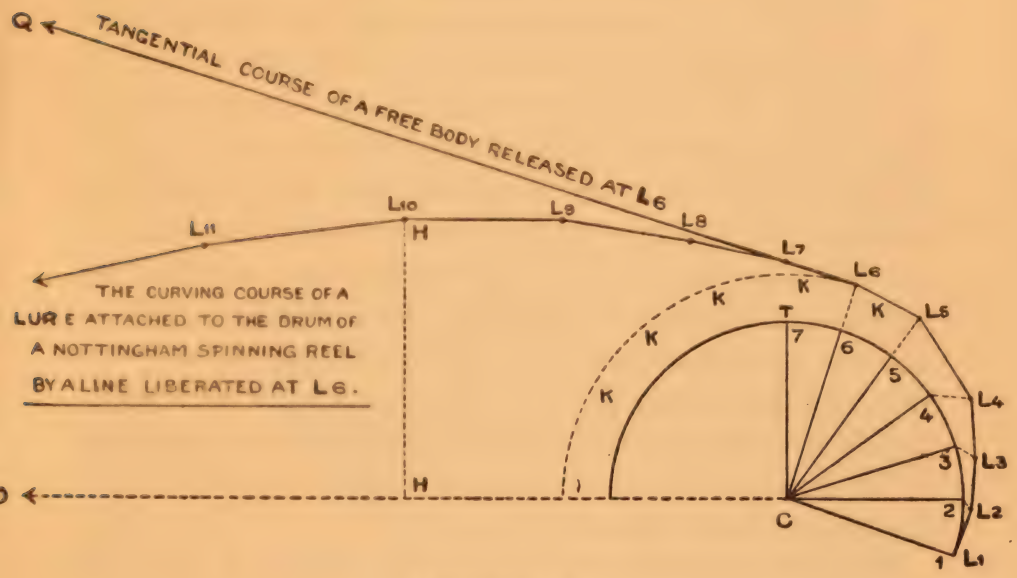


DIAGRAM 23.

Showing the passage of a lure when thrown from an ordinary Nottingham spinning reel.

DIAGRAMMATIC CONSIDERATION OF SPINNING WITH ANY MAKE OF THE NOTTINGHAM REEL

In Diagram 23 the spectator is supposed to be above the fisherman, and to be looking downward at the horizontal sweep of his rod and lure.

In this diagram the rod can be regarded as the radius of a circle, of which C is the centre, T the top ring of the rod, and D the place at which the line has to fall.

As the body continues in an upright attitude, and as the

feet are not moved from their original position (see Fig. 1, Plate LII.), C may be taken as being unaltered during the motion of spinning, and representing the vertical centre of the fisherman's body and the pivot on which the rod is moved.

As the rod commences its forward side movement the lure is affected by radial and tangential influences, and by the time the rod, in its accelerating swing, has reached some such position as C^5, the lure should not only have acquired the same radial velocity as the rod point, but should have risen to the plane in which the rod point is moving, and should have increased its speed so that it is travelling in a line with the rod on a circle concentric with that made by the rod point (see D C L^5, Diagram 23) but—so far as the centifrugal influence is concerned—its movement has been checked by the line which is attached to the drum of the reel, and the centripetal force alone is taking effect.

So long as the speed of the rod is unabated and the length of the line unaltered, the lure will continue to circle in its larger concentric circle K.K.K.

In order to propel the lure towards the fish it has to be released from this circle, and to obtain accuracy of direction this release must occur at some definite angle of its radial swing.

The movement of the rod is, however, only accelerated up to a certain angle of its radial movement, after which its speed begins to diminish. In order, therefore, to get the best effect of this accelerating force of the rod, the lure has to be released from its controlling influences,—*i.e.*, a free rotation of the drum on which the line is wound has to be permitted—while the radial speed of the rod top is accelerating. The point at which this release is effected is determined by such a trial cast as already described.

The trajectory of the lure after the drum is released from control is shown in Diagram 23. This curve may be taken as fairly representing the course of a lure when correctly thrown from any make of a Nottingham reel.

When the rod in its side swing reaches the angle at which a free rotation of the drum is required, say at C 6, the drum is permitted its freedom of revolution. Were the lure entirely released from control, it would obey its centrifugal impulse, and fly off at a tangent to the circle in which it had been moving (see L^6Q, Diagram 23) ; but it is not free, and we have to consider the retarding influence of the line, which not only prevents its taking such a tangential line as L^6Q, but which will affect and influence its direction onwards.

As the lure leaves its radial course and assumes a tangential one, the line will begin to be frictionally affected by its passage through the air, by the frictional resistance of the rod rings, and by its having to overcome the inertia of the drum. From these causes the direction of its tangential flight will be altered, and its course will be curved slightly inward and towards the place to which it is destined.

As the inertia of the reel is overcome, the other checking influences increase in their effect, tending to check the passage of the lure through the air and affecting the curvature of its course, but this centripetal influence is thereon lessening gradually, and making the trajectory flatter in character as the lure travels onwards to its destination.

The principal retarding factor is the line to which the lure is attached. Owing to the free rotation of the drum of the reel this line is lengthening rapidly, and owing to the curving course of the lure, is being drawn sideways through the air. To a small extent it is being moved forward at one end by the rod top, and to a greater extent at the other by

the lure, and each increasing inch of its *curving* surface is subject to the more or less direct frictional resistance of the air.

The Check on the Drum

The backward belly of the line as the lure travels onward from L 11 is an important factor in accelerating the revolution of the drum of the reel, and hence, as the braking action is applied to the drum, and as the lure gets more into line with D, Diagram 23, this belly will be gradually straightened out and if the reel has been properly controlled the line will, by the time the lure reaches the water, be nearly in the straight line of CD.

The more directly the lure can be projected to its destination, the less will it require centripetal control to influence its course; the more divergently the line is projected when released from control, the greater will be its curve through the air, and the greater will be the resistance it meets, and the greater the necesssity for such a resistance if it has to be curved towards its destination.

Hence, if the greatest possible distance of casting is required, the more correct the principle which tends to reduce the necessity of centripetal influences after the line is liberated, and permits of a direct, or at least of a more flattened trajectory between the rod top and the destination, the better. In Diagram 23 the greater the cord HH, the greater will be the retarding influences of the line, and the greater the necessity for such retarding and curbing influences.

But the necessity for this centripetal influence ceases as the lure approaches its destination; for its course becoming a straight one the influence of the line is only a retarding one.

The Automatic Starting Mechanism of the Drum of Spinning Reels

Automatic mechanism for starting the rotatory action of the drum of a spinning reel, in order to lessen the retardation of the lure caused by the inertia of the drum, should increase the distance to which the lure may be cast, but such mechanism will render the reel more complicated, and its management more difficult to acquire. The angles at which the drum is automatically started, *i.e.*, the moment when the line and lure are released from the check of the drum, will differ from the angle at which the drum is released when using an ordinary Nottingham spinning reel, and the automatic starting apparatus will have to be regulated from time to time in sympathy with the weight of the lure and the velocity imparted to it by the radial action of the rod point.

If for instance the automatic starting gear were regulated for casting a two ounce lure from a twelve foot spinning rod, it would, unless altered, give the drum of the reel a rotatory velocity greater than that required to supply the line which a half ounce weight cast from a nine foot rod requires, and consequently unless regulated, the drum would over-run the line with the lighter lure.

If the lure is a very light one, and the line to which it is attached is wound up on a revolving drum, a good method of releasing the line is that in which the spool acts as does the drum of the Illingworth, or Malloch's reel.

The lighter the lure, the greater the difficulty in overcoming the inertia of the drum, and the greater must be the trajectory of the flight to its destination ; and *vice versa*.

The greater the weight of the lure, the greater the distance it should attain, and the attempt to apply automatic methods of overcoming the inertia of the drum at the moment the line is released in the act of spinning, is only made to bring the usefulness of the ordinary spinning reel into line with

those which, like the Illingworth, are solely designed for casting the very lightest of lures.

It is a simple matter to apply a mechanism to a spinning reel so that, simultaneously with the release of the drum, its rotatory action could be accelerated, but a simple and effective means of regulating this impetus to the various weights of the lures used when spinning has not so far been established on a reliable basis.

Automatically starting the reel will also mean that the lure would have to be liberated on a different tangential line to that adopted in the ordinary method of spinning from the Nottingham reel, and a fisherman who had been accustomed to use the ordinary Nottingham reel would when using this accessory have to vary his habit of casting. He would, if everything went well, reap this advantage—the lure would proceed with less trajectory, *i.e.*, in a more direct manner to its destination—the curvature made by the lure and the line being reduced—and as less frictional resistance would then be offered to the progress of the lure, a greater distance could be attained.

It seems to me that in fishing from a pier or from the shore line, when a distant cast is desirable, such a mechanism is hardly necessary, as distances approaching 117 yards have been achieved when using the original Nottingham sea fishing reels.

The less the tangential direction is altered by having to overcome the inertia of the reel, the more directly can the lure be thrown towards its destination.

This will be seen from the Diagram 24. For the sake of argument we must suppose that the lure which is attached to the rod and line when an Illingworth reel is used, does not suffer from retardation, and consider at what point the lure should be released during the swing of the rod in order to arrive at the place D.

The radial direction is altering at each second of the rod action, and therefore if the cord of an arc were drawn from a point A in the circle described by the radial movement of the top rod, one inch to the right of the point T, which is situated at a right angle to the direction D, (Diagram 24), to a point A one inch to the left of T, the direction of AA would indicate the direction of its tangential force, and a lure suddenly liberated from a point T in this action would fly off in the direction of D, parallel to C D.

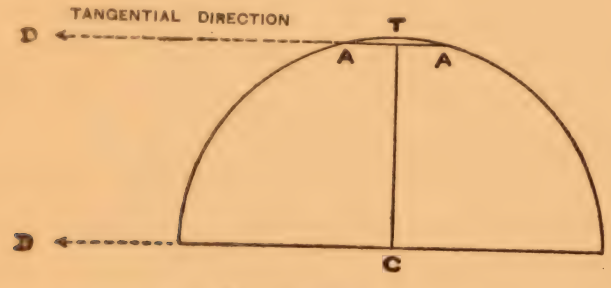


DIAGRAM 24.
Showing the direction taken by a lure liberated at T, when it is not subjected to centripetal influence.

In spinning with an Illingworth reel or a Malloch reel, this is practically what happens, for the only retardation is one which is due to the frictional contact of the line with the rings of the rod,* and that made in passing over its own turns on the spool. The rod force therefore culminates at T, and the lure liberated there will fly off in the tangential line AA, the slight retardation above mentioned being the direction of the lure round and towards D.

If, however, the lure be not liberated in the true meaning of the term, retardation of some sort must occur.

* This is noticeably so with the Malloch reel, for the spool or drum of the reel, on which the line is wound, is from three to four inches in diameter, and as the line is rapidly drawn off the spool in the axial direction, a running spiral curve in the line is created, and a considerable check occurs as these coils pass through the guiding rings of the reel.

The greater the retarding forces of inertia, the resistance of the air, etc., the sooner in the radial swing of the rod must the drum be permitted to revolve freely.

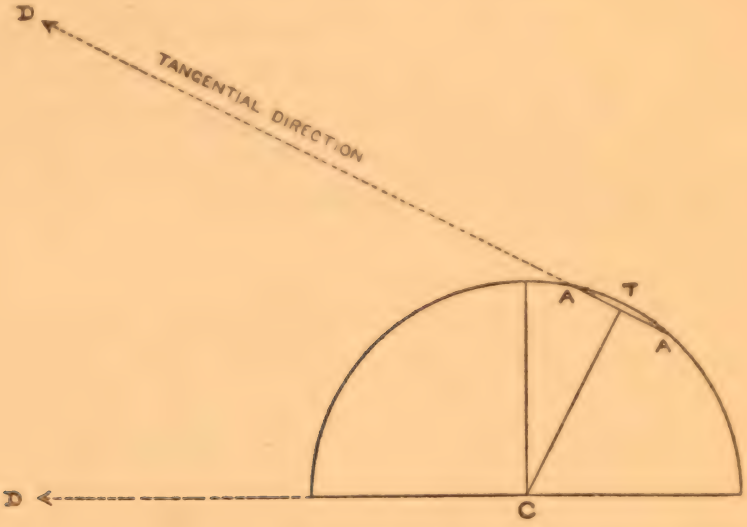


DIAGRAM 25.
Showing the direction taken by a lure when liberated at T. When this is subjected to centripetal influence its course curves towards D.

When using an ordinary spinning reel the drum is permitted its freedom when the rod point has arrived at some such angle as C T, and as the lure is circling round in the concentric circle. Its centripetal or retarding forces have therefore to so alter the direction of the lure from the line of its tangential impulse AA as to curve it inward to its objective point at D. See Diagram 25.

We must now consider the method of using the rod when casting the lure from a spinning reel.

THE RIGHT SIDE CAST WITH THE DOUBLE-HANDED SPINNING ROD

The Spinning Rod should be held in a similar manner to the double-handed fly rod, the right hand being above the reel, and the left hand below it, but the left hand should be

so situated that it can easily and comfortably control the mechanism of the spinning reel.

It will be well for the student to remember that the forward movement of the spinning rod is the only one which needs any consideration, for the movement which corresponds to the backward action of the fly rod is effected by merely winding in the lure and turning the body and rod in a direction more or less opposite to the spot at which the lure has to fall, which latter is indicated by the letter D in Diagrams 23, 24 and 25.

Practice has proved that if a swinging impulse is given to the lure prior to commencing the actual forward side movement of the rod, a more pleasant and effective spinning cast can be made; the reason being that such a swinging motion brings the lure at the end of its back swing nearly to the level of the top of the rod, thus bringing it into the plane in which it has to travel. Consequently, the snatching movement, which is so perilous to an effective cast, is by this means avoided. It requires some little attention, however, to effect a forward motion of the rod at the correct moment of the swing of the lure, and therefore, when practising, I should advise the student to start his forward swing when the lure is in a state of inertia. He can thus devote his whole attention to the more important consideration of the forward rod action and the manipulation of the reel.

The Starting Point

The forward right side swing of the rod should commence from a position of inertia, the lure hanging down from two to three feet below the top of the rod. The point in the horizontal circle to which the rod has to be held, when starting this movement, will depend on the weight of the lure which is being thrown, the length of the rod, etc. The lighter the spinning bait, the greater the frictional

resistance to the free rotation of the drum of the reel, the shorter the rod, etc., the further back must the rod be brought before starting the forward cast with any ordinary form of Nottingham reel.

Assuming that the weight of the lure is between one and two ounces, and the rod about eleven feet in length, the position from which the rod point should start will be an angle of about thirty degrees to the right hand side of the fisherman as he stands with his back to D. The position of the body should be as shown in Plate LII., Fig. 1, the weight should be on the right foot, the arms bent, the body upright, and facing away from the direction D. The vertical angle at which the rod should be held is about twenty-two degrees above the horizon.

The Action of the Rod

In order to make the cast, the rod should be swept round sideways, with sufficient radial force to project the lure to D (Diagram 23). The hand which dominates this movement should be the left hand as in the forward, side or overhead cast with the fly rod, the right hand acting as a moving fulcrum and at the same time guiding the direction of the rod. The arms should not be straightened.

The actual motion of the arm should be as nearly as possible that made by a man when he is mowing. The swing of the rod should start from inertia, as in the golf drive, and its motion should be an accelerating one until it reaches a point in its radial swing—T—at right angles to D (Diagram 23). Its speed should have been such that the lure will have extended itself in the same line as the rod before the drum of the reel is released. The point of the rod in this accelerando swing should rise gradually in order to give an upward as well as a radial movement to the lure.

THE ATTITUDES OF THE BODY WHEN CASTING A SPINNING LURE FROM RIGHT TO LEFT.

(1) THE START—NOTE THE FEET—THE START OF THE SWING. (2) THE MIDDLE OF THE SWING AFTER THE DRUM HAS BEEN RELEASED. (3) THE END OF THE SWING AS THE PAWL REGAINS CONTROL OF THE DRUM. (With regard to the position in Fig. 3, see final par. of this chapter.)

Figure 2, Plate LII., will show the position of the body just after the drum of the reel has been released. It will be noticed that the rod has risen from an angle of twenty-two degrees to about forty-five degrees above the horizon. The body is now facing sideways at right angles to the line of D.* The weight of the body now rests evenly on both feet, both arms are bent, and the accelerating motion of the rod has just reached its culminating point. The drum being released, the lure is flying off more or less at a tangent to the circle made by the rod point. As has already been explained the tangential direction is now being affected by several curbing factors, and by their influence it will be drawn gradually round until it is, while gradually losing its speed, proceeding in an almost direct line to its destination, D. The drum of the reel, however, is not losing its speed to the same extent as the lure, and its rotation has, as explained previously, to be delicately retarded.

Figure 3, Plate LII., shows the end of the forward cast. The weight of the body is now resting more on the left foot, the rod point has dropped to a slightly lower angle, and the lure is falling towards D.* The arms are still bent, and the rod is pointing to the right hand of the line D (Diagram 23), but the rod still follows the line as it settles down, and should ultimately point to the spot at which the lure falls on the water, the pressure of the finger being then released, and the reel allowed to resume its normal condition.

If the correct manipulation of the reel has been made into a habit, the whole attention can be devoted to the movement of the rod; the arms should do the work, swinging the body at the same time as the rod.

The difficulty in casting from the spinning reel is that the mind has to be concentrated on a rod motion, which is made

*See Diagram 23.

as though the fisherman were casting his lure to a point at right angles to, and not towards D (Diagram 23), no matter in what plane the cast is being made.

In the right hand side cast the effort should be—as at golf—a swing, whose force is greatest at that radial point of its circling movement, which is at right angles to the direction of D (Diagram 23). In the overhead cast the swing should be made with an upward motion in a vertical arc of a circle instead of a downward one,* the mind being concentrated on the upward effort, the greatest force being used towards the zenith.

I cannot help referring at this moment to the oft-repeated advice, " Keep your eye on the ball." Golf authorities frequently refer to the fault of not keeping the head down, but of moving it before the club has struck the ball, their idea being that the movement of the head, or the fact of the eye being taken off the ball, is responsible for the foozling of the shot.

Accuracy is not due, however, to the fact that the eye is kept on the ball, or that the head remains stationary, but that the *mind* has remained stationary to the object which the golfer should have in view, *i.e.*, the striking of his ball. If his attention should wander from this object, in spite of the fact that his head is kept down, he will, unless he has made a habit of a correct stroke, foozle his shot. If for instance his mind turns to the consideration of the direction in which his ball will go before he has struck the ball, his drive, etc., will suffer, for his swing will not reach its maximum force when the face of the club comes into contact with the ball, but at some point in the course nearer the direction to which he has turned his attention.

Among the many fine axioms given by the late General Nogi to the Japanese youths, on the night of the funeral of the late Emperor of Japan, was the following :

* As at golf.

"Pay attention to what you are looking at. A person whose eye is always wandering gives evidence of an unstable mind,"

or in other words—A wandering eye denotes a wandering thought.

A habit having already been formed as to the angle at which the drum has to be released from the controlling influence of the pawl, a perfectly even accelerating movement as in mowing should be made towards and through this angle to a point at right angles to D,* the motion of the rod diminishing from that point until it comes to a state of rest as shown in Figure 3.

At the moment when the lure is released, it should have been flying round in a line with the rod and concentric with the rod top. The effect of releasing the drum and allowing the centrifugal force to come into play will be to permit the lure to fly outward and apparently, to the eye of the fisherman, be retarded slightly behind the direction in which the rod is moving, but as the frictional resistance of the air to the line, and the frictional resistance of the rings of the rod to the line, etc., come into play, and as the motion of the rod gradually diminishes, the lure, curving inward, may again pass the direction in which the rod is pointing and proceed in a gradually flattening curve to D. The body should be kept as upright as possible and the weight altered from foot to foot as in the golf stroke.

The whole of these movements should be carefully considered, until the thoughts which have to accompany the actions become a mental habit, and if then the above method of spinning be adopted, great accuracy in casting will be attained—not as a knack, but as a habit.

Briefly, when the position No. 1, Plate LII., is taken up, the attention should be directed to swinging the rod with a

* See Diagram 23.

circular mowing action which increases in speed until the rod has attained a position T, at right angles to D, when the rod and body should be as in Figure 2. The dominant force should be applied through the left hand, and the lure released from radial control at an angle such as A, which the trial casts have shown to result in accuracy of direction. The rod should rise in a gradual curve and its speed be gradually lessened after passing T. The final position of the body should be as in Figure 3. The rod, after it has arrived at the position in Figure 3, Plate LII., should be permitted to settle into its normal fishing position.

In Figure 3, Plate LII., I have faced the camera, in order to show the exact attitude of the body, arms and feet at the end of the forward swing. The spectator has to imagine himself as being at the position D., Diagram 23, at which the lure has to alight, and not at T., as in Figures 1 and 2.

CHAPTER XX

NEW ZEALAND AS A FISHING GROUND

The Northern and Southern Islands of New Zealand have well been called the "Fisherman's Paradise," but the Dominion of New Zealand is as remarkable for its enjoyable climate, its beautiful scenery and its excellent shooting, as for its unrivalled trout fishing. The visitor will be well advised not only to take his fishing gear, but also his shooting outfit and his camera.

The moose, Wapiti, Virginia, Columbia, Axis, Japanese deer and chamois, and mountain goats have been introduced for several years, and are increasing so rapidly that they are at present included in the shooting now open to sportsmen ; the red deer afford trophies finer and larger than are obtainable in Europe.

Loch Leven and Rainbow trout attain a size unknown in other parts of the world, affording in every part of the islands the most excellent sport, and wild cattle, wild boar, wild duck, wild goats, pigeons, pheasants, hares, etc., are common in many parts of both islands.

The fisherman has the choice of either wet or dry fly fishing, spinning or trolling—with the certainty that in every district he visits he will not only find abundance of fish, but fish whose size and fighting qualities are unequalled, while his sport will take him into regions whose interest and beauty are unsurpassed in their variety and charm.

That both the Rainbow and the Brown trout grow to a size unknown elsewhere and multiply so rapidly is due first

to the abundant supply of natural food in the rivers of New Zealand, secondly, to the climatic and meteorological conditions, which are eminently suitable to their growth, etc., and thirdly, because there are no otters or other enemies of their own kind preying upon them or their natural food. In Canadian rivers and lakes, which present a vast and varied field to the fisherman, many other kinds of fish exist, and, like the muscalonge, feed on and destroy every other variety of fish, including trout.

Trout fishing commences in both Islands on October 1 and continues until April 30, with the exception of the Rotorua district, where the season opens on November 1, and continues to the end of May. It is advisable therefore, when it is desired to fish for the whole season in New Zealand, to start in the South Island. If the tourist arrives at Christchurch in the South Island about October 1, he will be able to get good fishing at once. He will find that the first month of the season is not so favourable to dry fly fishing as fishing with the wet fly or minnow. In the rivers it will later on be possible, with the dry fly, to kill trout up to 3 and 4 pounds in weight, while the average weight for the trout in the smaller streams may be regarded as about one pound.

The brown trout run up to 15 or 20 pounds in weight, and though big trout may occasionally be induced to take the dry fly, yet the wet fly or the minnow at the opening of the season will be the best method of fishing.

The natural food of the trout is abundant, but it is varied, and the fisherman should have and be able to use different kinds of lures, in order to imitate the food upon which the fish is feeding at any particular moment of the day, night or season.

The fisherman who goes to New Zealand unaccompanied by a servant may find it difficult to obtain a man who will

serve as a gillie or a body servant. Wages are high, work is abundant, men are scarce, and in such a democratic country as New Zealand there is a disinclination on the part of the class which is represented by those to whom we allude as the labouring or servant class, to render personal services to any man. If therefore the tourist is used to the services of a valet nothing would suit his book better than to take such a servant with him to New Zealand, and if such an one can cook, can valet, and is accustomed to roughing it, he will be of the greatest possible use and comfort during a fishing trip. If not, it is better on one's arrival at Christchurch or Wellington to try and obtain the services of some such a servant, especially one who has already had some experience of camping out in New Zealand.

In the South Island the streams are, I think, more get-at-able than in the North Island, and if the fisherman desires to be independent and to start at any particular moment from one place to another, or to go to any place for a few days or hours, the trip will be rendered much more pleasant if he has his own means of transport.

The tourist to New Zealand must remember that those rivers in which he may get the best sport are likely to be in districts which are often inaccessible to either motor car or buggy. In these cases if horse vehicles are used the animals can be turned into pack horses as occasion requires, and the necessary tent, food and clothing can be taken from the buggy, etc., to any desired fishing. A buggy with two horses can be hired at a certain definite price, and can be taken for a week, for a month or longer, and may be only necessary for a certain portion of the trip. If a long journey has to be made the railway companies offer facilities for transporting both horse and buggy, motor car, etc. Better still than depending on horses, which after all take up a considerable amount of time in grooming, feeding and

watching, is to hire a car. There are several agencies for letting out touring cars, and, as the roads as a general rule are quite good enough for motor travelling, a car is obviously much more convenient for transporting one's belongings and for rapid transport. If a car be taken it can be left at the nearest farm house when the neighbouring rivers are being fished. The farmer can be relied on for helping—and guiding the fisherman to the water he wishes to fish. These suggestions are made, if perfect freedom of action, comparative independence, and comfort be a consideration, but if the fisherman is contented with getting the ordinary trout fishing common all over the Northern and Southern Islands, he has ample opportunities of obtaining the best brown trout fishing in the world, by depending on coaches, postal arrangements, railways, and the help of the New Zealand Tourist Agency.

All of the streams and rivers of both Islands can be fished from the banks, by wading or from canoes. The streams and rivers of the Southern Island are more open and more easily fishable from the bank than those of the Northern Island.

Near the mouths of the rivers, in or just above tidal water, are some of the largest brown trout in the world. running from 15 to 24 pounds in weight, and affording most exciting sport. The times at which these big trout seem to be most frequently taken are during the half lights—early in the morning or late in the evening—but the movements of the tide will alter the time of day which gives the best sport—the trout coming in with the tide and descending again as the tide runs out. When fishing for these, salmon tackle will have to be used. The rush down-stream of these monsters can only be met by the strongest tackle and the most determined opposition. Although the general fighting character of these big brown

trout varies according to the season, the average fish will put up a fight equal to any clean run salmon of equal weight.

Night fishing, however, is in my opinion never so satisfactory as day fishing. Fish will rarely play at night with the same dash and vigour that they show during the daylight. This may have some bearing on brown trout fishing in New Zealand (Southern Island) for it is a fact that the vigour and resistance of the trout vary tremendously at different times, and that though day after day and night after night, each fish may put up a magnificent fight, yet this glorious spell of good fishing will be followed by others during which the resistance of the trout caught would hardly excel that offered by a fairly good stream caught English pike. In this respect the brown trout differs from the rainbow trout or the sea trout; either of the latter will always fight vigorously to a finish. In any case, taking an average of pound for pound, the brown trout will, I consider, during a season afford more sport than will a salmon under similar conditions.

In addition to brown trout a certain number of rainbow trout are to be met with in the Southern Island, but the brown or Loch Leven trout are the most common fish the tourist will encounter. Besides brown trout, eels, which grow to a tremendous size, exist in some of the lagoons, reaching as much as 30 pounds in weight. These eels will feed on water fowl, are tremendously voracious and would no doubt attack any living creature unlucky enough to fall into the water. The colonists in certain parts kill them by spearing them. A client of mine having shot a water fowl of some size, was amazed to see it seized and torn to pieces by eels in one of the lagoons high up among the mountains of the Southern Island.

In some parts of the South of New Zealand during the warm weather the fisherman is subject to the attacks of

sand flies, etc., which are so bad that without some effective fly repeller they will most effectually prevent fishing. The specific sold by Messrs. Allen and Hanburys, Ltd., called "Muscabane," is unrivalled in its power of driving away *every kind* of *flying* or *creeping* insect pest. It is made up in one ounce and two ounce tubes, and the effect of a very little of this cream applied to the face, neck, arms, etc., will last for several hours. It is not only a preventive, but it is a cure for bites already inflicted, and is extremely pleasant in its perfume.

In no other country in the world does the Government take such a paternal interest in the success of the sportsmen who visit its shores as does the New Zealand Government with regard to its sporting visitors. Both in the Northern and Southern Islands are established numerous offices of the New Zealand Government Tourist Agency, and if the tourist be in difficulties, no matter what the circumstances, if he can only get a message to the nearest office of the agency, he will find his difficulties are things of the past. Every information as regards hotels, fishing and shooting districts and quarters, mountaineering or sight-seeing, is provided free of charge, and the visitor can place himself unreservedly in the agents' hands, secure in the knowledge that the best and at the same time the most moderate methods of accomplishing the object of his visit to New Zealand will be explained to him.

Convenient and cheap railways, steamboats and coaches take the tourist from one part of New Zealand to any other part, and the expenses of a fishing trip to that country compare very favourably with those of a fishing trip in any other portion of the world, while the certainty of obtaining any amount of the best sport is assured. Not only have the moose, the elk, and Virginia deer been introduced by the agency of the New Zealand Tourist Department, but the

red deer and wild boar, pheasants and abundance of birds are common and afford excellent sport. The cost of a sportsman's licence, which has to be obtained from the Government, is by no means heavy. The boars have been a feature of both islands since the days of Captain Cook, who touched at Wellington on his passage between the Northern and Southern Islands, and the descendants of the pigs he let loose on the Southern Island provide some of the finest trophies obtainable anywhere.

The fishing in the Southern Island can be enjoyed until after Christmas, and it will then be well for the tourist to proceed to the Northern Island—the island which is so celebrated for its rainbow trout. The two or three months which he will thus spend in the lower island will have afforded him experience which will be among the most exciting and pleasant reminiscences of his life time. He will have had some thoroughly good sport, he may possibly have come across many other travellers and have formed many delightful acquaintances, while he will have been living amongst the most beautiful, striking and interesting scenery in the world.

The fishing tourist in the Northern Island should depend on the advice he receives from the New Zealand Agency with regard to the best method of reaching the particular rivers he desires to fish.

The most interesting river in New Zealand is the Wanganui. It can be reached easily by rail, either from Wellington or Auckland, and both above and below Taumarunuii it should be fished from a boat or canoe. It is probably the most beautiful river in the world, unsurpassed either in its grandeur or scenery. It flows from the centre of the Northern Island and empties itself into the sea about 150 miles north of Wellington. The Wanganui is as rich in legendary lore as in

grandeur and beauty. Brown trout are not common, but rainbow trout from 4 to 20 pounds are killed in this river. Both wet and dry fly should be used. The most desirable way of fishing this river is to obtain Maori guides with canoes, start well up towards the source, and dropping down with the current, fish and camp as fancy dictates. Sometimes, it may be, the main river will be joined by some beautiful and trout-abounding streams, but whether fishing these with the dry fly, the glides with the wet, or spinning in the rougher water of the rapids, sport, and sport of the best, will be there, and in a profusion sufficient to glut the appetite of the most determined record hunter. If one of the party happens to be a good cook, and if rifles and guns are taken, the fisherman will be certain that his larder will be supplied at times with other forms of food.

Leaving the Wanganui, the best known resort for fishermen, there is the Taupo or the Rotorua country where the tourist will be in the midst of the wildest and most volcanic part of the thermal district, and in the centre of probably the best and most prolific trout fishing in the world. For two or three years, now happily past, in some of the lakes of the Rotorua district the fish seemed to be troubled by disease, a great many of those caught presenting the appearance rather of kelts than of healthy fish ; this may perhaps have been due to the tremendous slaughter which had been going on during the preceding years. Mr. Donne, for a long time the head of the New Zealand Agency and one of the best known sportsmen in New Zealand, considers, and with reason, that the better and stronger fish were naturally the first to seize the bait and the first to be caught and it was not until these began to be killed off that the leaner and poorer ones began to be in evidence. Mr. Donne, who is now the Representative of Emigration at the High Commissioner's Office in Victoria Street, London, was the

PLATE LIII.

THE BULLER RIVER.

PLATE LIV.

THE WANGANUI.

PLATE LV.

LANDING A 2-LB. BROWN TROUT, SOUTHERN ISLAND, NEW ZEALAND.

principal or head agent of the New Zealand Government Tourist Department, and as such he arranged a system of pounds in each of the larger rivers running into Rotorua, and all those fish taken in these pounds, which presented a kelt-like or diseased appearance were killed and used as manure, the healthy fish alone being allowed to live. By this means the size and quality of the fish during the last five or six years has considerably improved, and the kelt-like trout have practically disappeared. Plentiful as is the supply of natural bait in these waters, yet it may not have been sufficient to provide food for the immense numbers of rainbow trout which have thronged these lakes. I think also that the temporary falling off in the weight and condition of the trout in Rotorua may be due to the effect of the sulphur springs.

It is well to remember that in all volcanic regions, the seismatic disturbances are the pulses which indicate the vital energy of the moment—pulses which beat, therefore, with intermittent force, and consequently the amount of sulphur which these volcanic agencies send to the surface of these lakes may undoubtedly have been greater during the one, two or three years, in which the condition of the trout suffered, than during the preceding or succeeding one, two or three years. This, then, may have been the factor which caused the temporary deterioration in the condition of the rainbow and brown trout with which the rivers and lakes of Rotorua were supplied. Quite apart from the scientific aspect of the illness which attacked the trout of Rotorua is the report of all fishermen that the trout which presented the kelt-like appearance were more or less affected by a species of worm. As worms are common among English trout in certain seasons of the year, this may have been only applicable to certain meteorological conditions of New Zealand. Rotorua was the first place where the rainbow

trout were introduced, and the catches of them in these lakes continue to furnish new and wonderful records for lake fishing.

Undoubtedly the river in New Zealand which has yielded the greatest individual takes of trout, and which is therefore the best trout river in the world is the Tongariro.

As regards the size of the rainbow trout in the Northern Island fishing, where the Tongariro discharges itself into Lake Taupo, six trout were taken by one rod in 1911 on one night averaging 17 pounds each.

The female rainbow trout in the Northern Island in January and February will give as much fun as sea trout of the same weight. This is the highest praise that can be bestowed on a fish, and although the big fish do not come at the dry fly, the struggle that ensues when a fish is caught with a wet fly, will repay the voyage to New Zealand.

Major Squire, a fishing client of mine, killed in thirty-six days 240 rainbow trout weighing 2,034 pounds, an average of 8½ pounds per fish. My friend, however, whose interests are by no means centred in making records, looks upon his fishing as a scientific pleasure, and did not attempt in any way to emulate others, simply fishing as the fancy took him and discontinuing his fishing when he was tired. In 1910 one of the most indefatigable fishermen of New Zealand, in one day caught forty-two fish, weighing 419 pounds, and of these thirty-seven were killed on the fly. As this means an average of 10 pounds to a fish, I should think no more wonderful record has ever been made. Not only does it show the wonderful richness of the river, but it speaks of extraordinary endurance on the part of the fisherman. When it is remembered that a rainbow of 10 pounds will on the average give as much fight as a fresh running salmon of 16 pounds, the endurance in making such a record is marvellous. I have received

from clients of mine, who have returned from New Zealand, reports that the 1919/1920 trout fishing season has beaten all records. The fish are reported as being in excellent condition and plentiful, the rivers specially mentioned being the Oruro, Waikato, Rangotata, Tearoha, and Rakahi. Lake Taupo has also been fishing remarkably well.

In 1905 a gentleman, Mr. Hardy Topham, came down from London to Sidmouth, at which place I was staying, in order to induce me to give him lessons in casting a trout fly. I had not considered the idea of starting a school at that time, but finding he was on the point of going out to New Zealand for a six months' trip, and that he had had no experience in fishing at all, I therefore took him with me for a few hours' instruction on the stream I was fishing in Devonshire. In the spring of the following year, when he returned to England, I received a letter from him, thanking me for having taught him how to cast, and stating that he had had the greatest success in New Zealand, as during the time he had been out there he had caught with the dry and wet fly over 1,500 fish, whose weight amounted to 4,500 pounds.

Another of my clients, Sir Edmund Lechmere, Bart., a well-known African sportsman, killed in the Tongariro river, two Trout weighing 16¾ and 17¾ pounds respectively, and many others in the same river up to 13¾ pounds.

My reason for quoting a few of the wonderful records which have been made in trout fishing in New Zealand is to give my readers some insight into the abundance of sport which is open to the fisherman who has the good fortune to visit that country. While the pride which attends the lucky possessor of some record head, or other trophy, is understandable, the indiscriminate slaughter of natural life which attends the making of a record bag, can only be accounted for by either the lust of killing or the wish to gain some

momentary distinction in the world of sport, and while the latter vanity may be somewhat explainable in the beginner who has had his imagination fired by the deeds of others, it is excusable in none. The judicious conservation of wild game in any country is the duty of those who govern, and while the New Zealand Government is fully aware of this duty, it considers that up to the present, owing to the abundance of trout, no ill effect has been produced by that which strikes the outsider as indiscriminate and wasteful slaughter of the game fish which abound in the rivers and lakes.

One of the most pleasant, health-giving and instructive sporting trips which can be taken is that from Southampton by the New Zealand Shipping Company's route *via* Newport News, Jamaica and the Panama Canal to New Zealand and Australia, thence by steamer of the Union S.S. Company from Sydney to Honolulu and Vancouver, across the Rockies, through Canada (seeing Niagara) to Montreal and Quebec, down the St. Lawrence and thence to Liverpool.

By leaving England about the 1st October the traveller will arrive in New Zealand for the fishing season, and after fishing, and travelling in the Southern and Northern Islands, he can then proceed to Sydney in time to enjoy the trout fishing in the Blue Mountain district and other parts of New South Wales.

Through the Canadian Pacific Company's agents in Sydney he can then book his passage to London, his ticket allowing him to stop wherever he may desire and for so long as he pleases. He will visit Honolulu on his way to Vancouver, arriving in time to enjoy the first of the fishing in Vancouver Island, and in Vancouver itself.

The wonder of the Rocky Mountain scenery, the agricultural land of the West, the North Shore of Lake Superior, the Provinces of Ontario and Quebec, etc., with all their

wealth of scenery and sporting advantages, will be passed through, and finally shipping from Quebec in the Canadian Pacific's Railway Company's boats—possibly the most comfortable and best equipped in the world—the traveller will, after a delightful trip down the St. Lawrence, and across the Atlantic, arrive at Liverpool.

By such an all round trip, the tourist will have experienced the finest trout and salmon fishing in the world, he will have been travelling all the time in British boats, seeing the wonders of our Colonies during the most delightful seasons, skipping the northern winter, and, if he was not formerly experienced it, he will have found the real charm of English colonial life.

CHAPTER XXI

FISHING IN CANADA

It is owing to the repeated enquiry of my clients with regard to Canada as a fishing ground that I am endeavouring in a short chapter to give some indication of the fishing to be obtained there.

Canada offers a vaster field and a greater variety of sport than any other country in the world. In Canada, if the fisherman will take the trouble to travel away from the beaten track, away from the railways and the big towns, he is certain under good guidance to obtain excellent sport in the way of fishing; but although trout rivers and streams are plentiful, the visitor must not expect in all districts to find a plethora of trout, though there are always sufficient in the Canadian streams and lakes to afford good sport.

One of the many enjoyable methods of getting trout fishing in Canada is by taking guides and a suitable outfit, and adopting the Canadian method of camping out, and it is in this innovation that the charm of Canadian outdoor life will be realized. It is the delight of living in the open, surrounded by the wildest and grandest scenery of Canada, which repays, and it is because the average fisherman has within himself a keen love of the natural, and an appreciation of the rugged grandeur of mountain and forest scenery, that the ever varying beauties of the spots to which his sport will take him in Canada will well repay him for roughing it and for the time he spends in such fishing expeditions, even should sport fail to realize his expectations.

The fish which abound in Canada include different varieties of salmon and nearly every variety of trout, as well as those splendid game fish the bass, the maskinonge, and the ouananiche or land-locked salmon.

The big game of the Dominion comprise moose, deer, caribou, wapiti, bighorn or mountain sheep, musk ox, grizzly bear, black bear, wolf, puma, Canadian lynx and antelope. Most of the species of game now found in Canada were formerly common to the whole of the continent of America, but many of them have been altogether driven out of the United States by the steady march of civilization, and have retreated beyond the international boundary to take up their abode in the greater freedom of the north. Here big game and small are yet to be found in great numbers, and Canada is therefore still one of the chief fur-producing countries in the world. In Canada the value of the wild life of the country has long been recognized, and by wise laws the Federal and Provincial Governments have protected all kinds of game from indiscriminate slaughter. Educated sportsmen throughout the Dominion are co-operating in this protection by the formation of game protective associations, and, as a consequence of this, big game has been on the increase in Canada during recent years, while at the same time the utmost freedom has been, and is, allowed for the enjoyment of legitimate sport. It is therefore to Canada that the European sportsman must go should he wish to enjoy the best fishing and big game hunting that can be found in America.

The Canadian climate is healthful and enjoyable. It is a veritable physical tonic, and for the sportsman it has the added advantage that there are no fevers or malaria such as are so common in the big game countries of Africa, India and South America. No poisonous snake need be feared, but it must be confessed that the sociability of the black flies will more than atone for the absence of reptiles.

Salmon Fishing.

Perhaps the best of the salmon fishing in Canada is that which is to be obtained from the rivers which lie on the Eastern Coast, and so fine is the sport that in certain rivers in New Brunswick—the Miramichi, Restigouche, Metapedia, Cascapedia, and the Nepisiguit—the fishing rights are worth a fortune. There are, however, numerous rivers where free salmon fishing may be enjoyed by visiting sportsmen.

In the province of Quebec for instance, every tributary of the St. Lawrence, both on the North and South Shores below Quebec City, and all the rivers emptying into the Bay of Chaleurs, unless impeded at or near their mouths by falls, are salmon rivers.

The salmon generally known on the Pacific coast of Canada are (1) the Quinnat or King Salmon, (2) the Sock-Eye or Blueback and (3) the Cohoe or Silver Salmon.

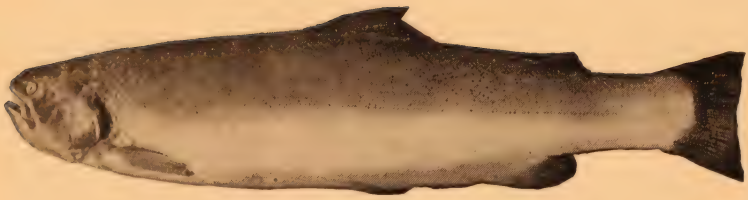
The first grows to a weight of seventy pounds or possibly to a considerably larger size. From the scales taken from the larger fish, they appear to reach the age of eight years. The Sock-Eye and the Cohoe are much smaller fish.

The Quinnat and the Cohoe afford the best sport to the Angler. They are to be taken in the summer by trolling or spinning from a boat at the mouth of the Campbell River, Vancouver Island; the Quinnat especially afford splendid sport.

It is generally considered that these game fish cannot be taken in fresh water, but I am of the opinion that this is only due to the fact that they are not so systematically fished for in the rivers of Vancouver, British Columbia, generally, as are the Atlantic salmon in home waters.

Spinning tackle for salmon should certainly be taken and tried, if a visit to the Northern portion of Vancouver Island is made.

THE QUINNAT OR KING SALMON.



THE OUANANICHE.

THE BROOK TROUT.

The Ouananiche, or land-locked salmon of Canada, is a game fighter, and there are to be found a number of lakes within easy distance of St. Andrew's, New Brunswick. where this splendid fighting fish is to be taken. Among them are the Chamcock, Limeburner, Bartlett, Steins, Snowshoe, Welsh, Cram, Turner, McCullough and Creasy. Most of these lakes and their tributaries have excellent trout fishing. One of the best places for sport with the Ouananiche is Lake St. John, with its tributary waters and the Grand Discharge. At St. Andrew's the angler will find no lack of places where excellent sport may be enjoyed. Another good place is Skiff Lake, about three miles from Canterbury, New Brunswick.

Trout Fishing.

Every known variety of trout may be found in Canada, the swiftly flowing streams and innumerable lakes forming ideal breeding places for this most popular of all game fishes.

The principal varieties of the Canadian Trout are the Grey Lake Trout, the Rainbow, the Cut-throat, the Brook and the Sea Trout.

The grey trout of the Laurentian lakes are fighters and grow to enormous size, and the angler if properly directed, will have no difficulty in making catches, the memory of which will stay with him as long as he lives. This fish is usually caught by trolling from a slowly moving canoe, the lure being sunk well down and moved in a slow series of short spurts.

It is a hopeless task to attempt to give even a partial list of brooks, streams and lakes where brook and lake trout may be caught. New Brunswick, Nova Scotia, Newfoundland, Labrador, Quebec, Ontario, Alberta, and British Columbia have each innumerable trout streams, lakes,

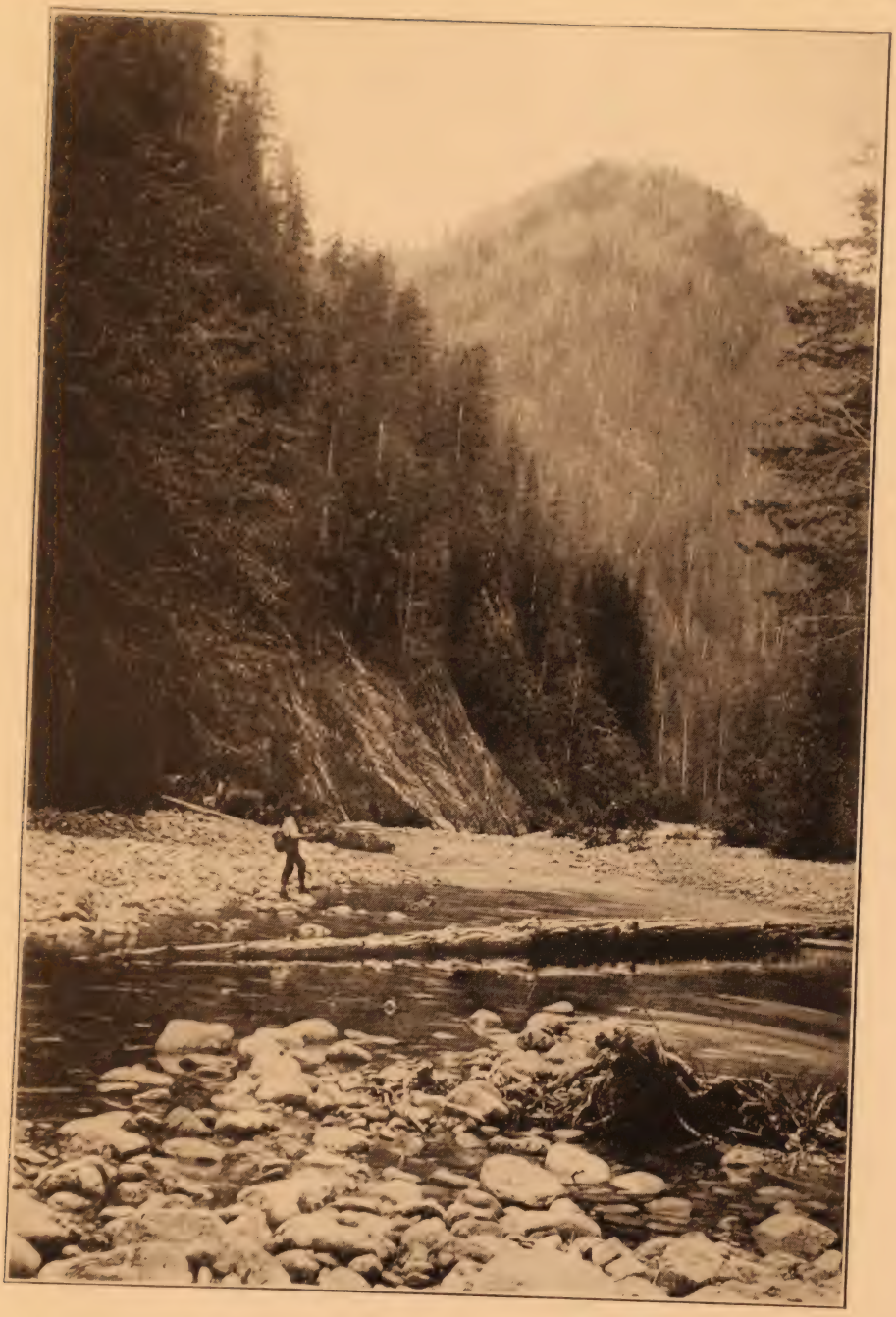
and rivers where the angler may be sure of finding good sport. From almost every station on the Canadian Pacific Railway in Maine and New Brunswick good trout streams and rivers are within walking distance. Quebec City is a good starting point for trout fishing, for within a few miles are Lake St. Charles, Beauport, Calvaire, Cache and other good fishing waters. The Laurentides National Park boundary is within twenty-five miles of the ancient and historic city. On the Nomining Branch of the Canadian Pacific Railway, reached from Montreal, good trout fishing may be had in a charming district of lake and mountain. On the Ottawa and Maniwaki branch there are many good fishing waters for trout, as well as at Cummings, eight miles from Grenville Station, on the Montreal to Ottawa Line.

In Ontario, best of all districts, is the wonderful North shore of Lake Superior, alongside which the Canadian Pacific Railway runs across trout waters that are world renowned.

Here are a few of the rivers in Ontario—Onaping, Spanish River, Apishkaugama, Michipicoten, Steel, Magpie, White, Little Pic, Monk, Black, Maggot, Gravel, Cress, Prairie, Upper Steel, Trout Creek, Wolfe, Mackenzie, Current and Nipigon.

There are many lakes and streams in the Canadian Rockies easily reached by the Canadian Pacific Railway near Banff, Field and Glacier, etc., and very fair fishing may be enjoyed amid some of the grandest scenery in the world.

Old man River, on the Alberta side of the foothills of the Rocky Mountains, offers some of the finest fly fishing in the Mountains. This stream is reached by wagon from Lundbreck Station, about fifteen miles distant. Both north and south forks are good, but the north as a rule yields the better fishing.



TROUT FISHING IN THE ROCKIES.

The Highwood River is a beautifully clear stream similar in many ways to the Dee, with splendid trout fishing.

Thorp Creek, thirty miles south of Calgary, is another very fine trout stream coming from the Rockies, and so also is Willow Creek, fifty miles south of Calgary.

These rivers afford ideal camping grounds in the foothills of the Rockies, and camping outfits, good conveyances etc., can be easily obtained at Calgary, Lundbreck, etc., but, as is the case from here to the St. Lawrence River, "Muscabane" is very much wanted.

From almost any town and from every station on the Canadian Pacific Railway in the Rockies trout fishing may be obtained, as also on the Crows Nest Line to the south. In British Columbia the Elk River with its tributaries affords fine sport, and is best accessible from Sparwood, about ten miles east of Fernie.

The Kootenay district for trout is hard to beat. On Vancouver Island, easy of access, is the Oyster River, a short distance north of Comox and also the Campbell river. Near Victoria are the Shawnigan Lake and Cowichan river, which afford good fishing. Close to Vancouver are the Capilano and Seymour Creeks, and the Squamish can also be reached from the same place in a short time.

Fish Lake, near Kamloops, is also an excellent place, and there are a number of adjacent lakes equally good.

Besides the different varieties of salmon and trout in Canada there are also to be caught maskinonge and bass.

The Maskinonge

The maskinonge is by far the largest game fish in the fresh waters of the Northern Hemisphere, and is well called the "water tiger" of the inland seas. It is popularly known in Canada as the "longe." These fish are said to

exceed one hundred pounds in weight, and are frequently five feet in length. The head of the maskinonge is large and flat, and its mouth will open wide enough to swallow prey of its own girth. It has a formidable array of keen teeth, sometimes half an inch in length. These teeth will dent a metal spoon and play havoc with an artificial minnow.

Maskinonge are invariably savage fighters, and will never surrender as long as life lasts. They are full of tricks, and will resort to endless experiments to relieve themselves of the hook. No two maskinonges will act alike when hooked, and in this diversity of tactics lies the great charm of the sport. For a contest that demands the highest degree of skill and adroitness this game fish is hard to beat, and the fisherman in a canoe who meets one has a struggle with one of the finest fighters in the fish world. Judging from my own experience, it is as stubborn an opponent as the tiger fish of the Zambesi.

The maskinonge is found in most of the rivers and lakes in the western portion of Quebec and in some of the large lakes in the eastern part of this province, also in Lake St. Louis and Lake of Two Mountains, near Montreal, the Ottawa River at St. Anne de Bellevue and Lake St. Francis. Among the Thousand Islands of the St. Lawrence River many mammoth maskinonge have been caught. In Ontario, Lake Nipissing, the French River and the Kawartha Lakes, reached from Bobcaygeon, give excellent maskinonge fishing. Of all of these the French River is the best.*

Black Bass

For sheer desperate energy the fight that this fish will put up is perhaps unequalled by any other fish of its weight. So fiercely will it contest every inch of the advantage gained

* The maskinonge is in appearance like a pike, and is frequently alluded to as a pickerel.

over it by the skilful angler that the latter never feels certain that the fight will end in his favour.

The favourite abode of the black bass is in cold and rapid water with gravel or rocky bottom. Its food consists mainly of minnows, frogs, crawfish and insects. This fish may be caught with the fly, bait or spoon, but no angler can ever tell for a certainty just what bait will at any moment prove best with black bass.

This fish is found in abundance in New Brunswick and also in Nova Scotia, Quebec has a great many good fishing places for bass, among which are the lakes and streams of the Ottawa river and its tributaries, up the Gatineau river, and in the lakes near the terminus of the Maniwaka branch of the Canadian Pacific Railway. Brome Lake, reached from Knowlton, Quebec, contains large black bass and plenty of them. Ontario has hundreds of places where good bass fishing may be enjoyed.

Sporting trips in Canada are of necessity somewhat extended, and therefore require careful consideration and preparation. The outfits necessary for such trips are varied in their composition, and the agencies which supply the necessary men, stores, canoes, or other means of locomotion, even when advance notice of such a trip be given to them, have at times a considerable difficulty in executing their instructions.

The canoe, which is peculiarly the water-craft of Canada, is the one great masterpiece which the Indian has handed down to civilization. There is no other form of boat so graceful, so responsive to the lightest touch, so easy of propulsion, or so universally adaptable. It may be said to be essentially a product of its environment. The shallowness of its draught makes it the ideal craft for the swift-flowing Canadian streams, with their numerous shallows and rapids. It is in itself so light that it can easily be carried

on the head from one stream to another ; it is so noiseless that in it the hunter can approach his quarry without the slightest sound, yet withal it has enormous carrying capacity.

It is therefore in canoes, and in the highways of Canada —its rivers and lakes—that one of the most delightful forms of travelling and of obtaining sport is to be obtained. With the camera, the rod and the gun, the traveller will find, if properly directed, the most fascinating and delightful of all wanderings.

A canoe trip down some of the rivers which run into Lake Superior on the North and East shores should furnish every delightful experience, and, if the river be carefully selected, an abundance of sport, especially of the wet fly variety, will be obtained; and here I must emphasize the necessity of having and being able to use the rods, reels, lines and lures, not only for the dry and wet fly method, but for spinning, etc.

A very enjoyable fishing trip may be had by visiting the reefs on the Northern shores of Lake Superior, and the rivers and streams which run into the Lake, but a strong and really well-found seaworthy motor boat, or small steam boat of light draught, should be hired in Sault Ste. Marie for this purpose, with a captain well experienced in the wilfulness of Lake Superior. A proper outfit of canoes, Chippewa Indians, a cook, and everything which is wanted, or which is likely to be wanted, will have to be taken, for when once the boat has started, civilization and all its advantages will be left behind. June and July will be the ideal months for such a trip, and the finest lake and river fishing in Canada may be had in one extending along the East and Northern Shore of Lake Superior from Batchawana Bay to the Mouth of the Nipigon. Rough weather—and this mighty inland freshwater sea can be most wondrous rough—will be encountered, but good seamanship will

always find a sheltered bay, the lee of some island, or some convenient river mouth to run into for safety, and no day on the whole of such a trip will be found to be without its sporting interests and its own charm and character.

The water of the lake is wonderfully clear and cold, and, except in the immediate vicinity of the camps, etc., bordering its shores, is unrivalled in its purity. Gently paddling from ten to forty feet above the vast boulders and spurs of granite, forming the so-called reefs of Lake Superior, in a Canadian canoe, and casting with a dry fly to each likely quarter, and near each protruding rock, will provide a charm as regards the beautiful, and a delight as regards sport, which will remain as a never to be forgotten page in the memory. Huge brook trout, running from two to eight pounds in weight, haunt the clear depths of these submerged wonderlands, and lie in their misty clefts and retreats waiting for the flies and insects which are blown or fly from the neighbouring land. Frequently when casting a dry fly, and when there has been no rise of trout, I have seen two beautiful shapes flash upward at the fly, and in their eagerness dash three or more feet out of the water. In the evening, and sometimes in the forenoon, on a calm day, when a gentle breeze is bringing out from the land its crowd of insect life, a rise will occur which is not easily forgotten.

On such a trip, however, as I am describing, reef fishing is only one item on the bill of fare. Trolling for the great lake trout, running up to 40 lbs. is to be had. Camping at the mouth of some lovely river or stream and canoeing up its ever varying and beautiful waters, gives the additional charm of river fishing, though in the latter part of July and August, especially south of Michipicoten, the temperature of the rivers will have risen and the river trout have sought the cooler waters of the lake.

The country is wild and lovely, and most varieties of game are to be met—bears and wolves are to be seen—but in summer are quite harmless. Moose and caribou trails are common, and serve to remind only of the profusion of life lurking unseen in the cover of these virgin forests.

In cruising down Canadian Rivers portages will be frequent, and therefore all baggage should be dispensed with except that which is absolutely necessary.

It must be remembered that, while every facility and assistance is given to the visitor by the Canadian Government, the Canadian Pacific Railway Company's servants, etc., yet the country is so vast and its fishing possibilities so little known, that the success of each trip will depend on the initiative of those in control of it. It is most necessary that there should be a similarity of desires and tastes among those of the party, in so far as each day's procedure is concerned. General information as regards the fishing qualities of a river, or even of a district, by any one *save an experienced fisherman*, should in all cases be received with great caution, and in every canoe expedition one member of the party at least should have had a personal experience of the rivers and lakes which it is suggested to travel.

Besides the unequalled wonder of the railway journey between Calgary and Vancouver, excellent fishing centres will be found in Banff and Sicamous Junction, and quite apart from the sport which can be made an inseparable adjunct of Canadian travel, this trip in an observation car on the Canadian Pacific Railway is one which cannot be equalled for beauty and interest. In its own manner it teaches a lesson as impressive and profound as the Temples of Egypt. The tourist will be surrounded by, or be within reach of, many of the most beautiful portions of the Rocky Mountains, and in no other mountain region do peak and

PLATE LVIII.

My Teepee in the Rockies.

PLATE LIX.

My Guide Engrossed in a New Sport.

cliff, snowfield and glacier, alpland and forest, lake, cataract and stream, form such a perfect combination as is to be found, not in one, but in hundreds of places in the glorious ranges of the Rockies and Selkirks.

Banff is one of the most delightful resorts in the Rockies, and the Canadian Pacific Railway Hotel is one of the most beautifully situated hotels in the world. It is the last word in modern hotels and it is very comfortable and well conducted. The Dog River runs through its grounds, and most interesting river and lake fishing can be obtained in the neighbourhood. Camping outfits and canoes are provided by Brewster's Agency of Banff.

While on a fishing trip to Forty Mile Creek, some fifteen miles from the Banff Hotel, I came across one of the Canadian Boy Scouts who had visited England in 1910—a son of the founder of Brewster's Agency, Banff. Though having an intimate knowledge of our colonists and appreciating the warmth of their Imperial feeling, it was quite a revelation to hear this boy tell of his visit and impressions in England. It would have done those who decry the Imperial spirit, etc., good to have heard and noted the sentiment which this trip to the old country had inspired in this youngster.

My guide, George Harrison, the head guide of Brewster's Agency, who accompanied me, was a very keen big game huntsman, but being initiated into the mysteries of fly fishing, his former indifference to the gentle art vanished, and he soon became an enthusiast (see Plates LVII. and LIX.).

Sicamous Junction Hotel is an excellent centre from which to fish the ramifications of Sicamous Lake, which, like a huge octopus, spreads abroad its gigantic reaches, interspersed with bays and rivers. A motor launch, rowing boats, canoes and experienced boatmen can be obtained. The Sicamous Lake, on which the Hotel is situated, the Shuswap Lake, and the Eagle River will provide salmon, sea

trout, rainbow trout, schwab fish, brook trout, lake trout, etc. The scenery is lovely. While I was there, an Indian speared on the Eagle River a lake trout which weighed 38 lbs. It was forty-two inches in length. The sea trout fishing in September is very good indeed, and the fish, which run up to 6 lbs. in weight, are excellent in their condition.

Rainbow trout are very plentiful in these lakes. Salmon are also plentiful, but when caught they are generally put back. Their flesh is not to be compared with that of the sea trout, the rainbow or grey trout.

When trolling from a canoe on these lakes I caught salmon up to 15 lbs. in weight, which had travelled many hundreds of miles, since leaving the sea, through the furious rapids of the Fraser river, and through the equally wonderful gorges of Kicking Horse Pass. Their appearance and condition was excellent. They were evidently making for the Eagle and other rivers which run into the Sicamous Lake. I found "Muscabane" of the greatest use here, for the mosquitoes, etc., are very troublesome.*

Some Canadian Salmon Records.

To give a better idea of the character of the salmon fishing in Canada, I take the liberty of borrowing some records given by the Hon. A. E. Gathorne-Hardy in his charming contribution to the "Fur, Feather and Fin Series." On a portion of the Cascapedia River, fished by the Governor-General of Canada, it appears that His Excellency, the Marquis of Lansdowne, when Governor of Canada, fishing during 1884, 1885, 1886 and 1887, an average yearly season of fifty days, killed to his own rod in that time 368 salmon, the total weight of these fish being 8,828 pounds, the fish thus averaging twenty-four pounds in

* A new fly remedy recently prepared by Messrs. Allen & Hanburys, of London.

weight, the largest fish killed in each of the four consecutive years being 43, 45, 39, and 38½ pounds respectively. The total number of fish killed by the whole party during this time was 1,245 fish, weighing 29,188 pounds, the average weight of the fish thus being 23½ pounds.

A better record even than this is given by Mr. Gathorne-Hardy for one season of 53 days, in 1879, over the same portion of the river, when Mr. Charles Ellis, Mr. Iveson, and Capt. Percy killed no less than 640 fish, the average weight being 24½ pounds, and the total weight 15,648 pounds. The best day's catch fell to Mr. Ellis, who caught 17 fish weighing 465 pounds. The weights of these fish were as follows, 38, 36, 36, 32, 32, 32, 31, 30, 24, 24, 22, 22, 21, 21, 20, and 20 pounds, that is averaging about 27½ pounds.

British salmon flies are recommended for Canadian waters.

With regard to the regulations affecting the close seasons, the licences, the permits, etc., which are of course necessary in Canada, the visitor should apply to the Provincial Government in whose province he proposes to fish, shoot, etc. It is inadvisable to embody them in book form, as they are subject to somewhat frequent changes by the authorities, but the latest information can always be obtained at the Office of the High Commissioner for Canada, 17, Victoria Street, S.W.

APPENDIX

SOME NOVELTIES FOR THE FISHERMAN, AND A FEW HINTS AS TO FISHING MATERIAL

No book, purporting to be of an instructional character, on any sporting subject, can be considered complete without some reference is included in its pages to the weapons which are so necessary to the successful pursuit of that sport.

I have, in my former works on fishing, dealt extensively with the specialities of our leading fishing tackle firms and do not think it necessary to go over the same ground again, but in the instructional portion of my text I have alluded briefly to some recent inventions which I thought would be useful to the fisherman. I am amplifying this information, and making my book more complete, by adding this appendix.

A New Spinning Reel

The ultimate value of any spinning reel will be determined by the simplicity with which it is controlled, the perfection with which its duties are performed, and in the ease, confidence and comfort with which it can be used.

It will be seen from the following description that not only has the Spinning Reel now described all these good qualities, but that in addition, it has original advantages in its construction, tending to its general usefulness and comfort, which have never so far been attempted in any other spinning reel. It is a reel so simple and yet so effective

that I invariably make use of it when teaching my clients how to cast with a spinning rod, and the facility with which they can in a few minutes learn to use this reel with no danger of over-running is only equalled by the pleasure they experience when actually fishing with it.

When casting *correctly* with the spinning-rod the danger of the reel over-running only commences as the velocity of the on-going lure begins to fall behind that rotatory speed of the drum which has been acquired by the initial velocity of the lure, and it is only necessary, therefore, if the rod action has been properly made, to effect a braking control over the drum during the latter half of any cast. One of the many advantages possessed by this reel is that at whatever time this checking action is required, during the flight of the lure through the air, it can be at once effected simply by increasing the pressure of the fingers on the lever handle. Plate LX.

A Consideration of this Reel

The drum spins well and can extend over seventy yards of line when casting. It is so controlled that it can be operated by the simple pressure of a finger of either hand, no matter which hand is uppermost on the rod, or to which side of the rod the handles of the reel are pointing.

In other words, the reel cannot be placed on the rod in a manner which prevents its being operated by the fingers of either hand, a unique and very valuable innovation. The levers are so easily operated and the rotation of the drum is so easily regulated, that practically no danger of over-running occurs, even when the reel is used for the first time.

The free rotation, the slight check which prevents over-running, and the return to the normal fishing condition of the

reel follow one another in clearly defined rotation, and are effected by

1st. A slight pressure of one finger.

2nd. An increased pressure by the same finger, and finally by

3rd. Releasing the pressure of the finger.

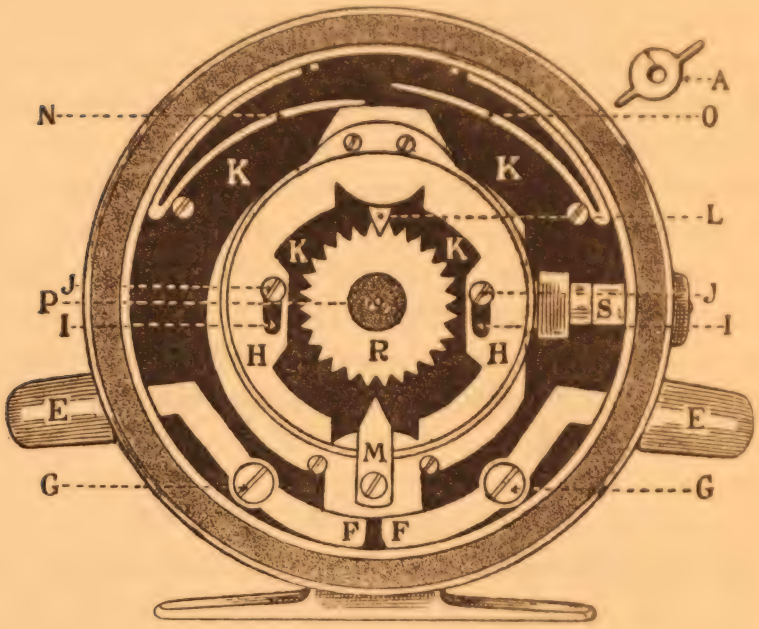


DIAGRAM 26.

THE FRED G. SHAW SPINNING REEL.

A—Butterfly nut which keeps the two parts of reel, Diag. 26 and Diag. 27, together.

E.E.—The alternative handles for working and controlling the mechanism or reel.

F.F.—The end of the levers of handles E.E., which operate the sliding plate H.H.

G.G.—Studs on which the levers work.

H.H.—Sliding plate carrying the pawls L & M and their respective springs.

I.I.—Slots in sliding plate.

J.J.—Guides fixed on to K.K. for sliding plate.

K.K.K.K.—Back plate of reel.

L.—The normal pawl, carried on sliding plate H.H., and which is disengaged from ratchet wheel,—thus permitting a free rotation of the drum,—when the sliding plate is moved forward by F.F.

M.—A light pawl carried on sliding plate H.H., which comes into engagement with ratchet wheel R., by a further movement of H.H., thus preventing the over-running of the line.

N.—A light spring operating against H.H. in its first movement.

O.—A stronger spring which comes into operation against the further movement of H.H.

S.—An adjusting screw pressing on the springs of pawl M., to regulate its controlling action over the ratchet wheel R.

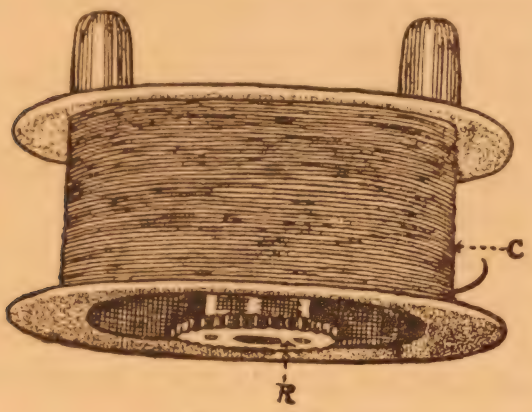


DIAGRAM 27.

THE DRUM OF THIS REEL.

C.—Showing drum of reel with line on.

R.—The ratchet wheel. It is shown in Diagram 26 as in position. The pawl L. comes into normal contact with the ratchet wheel when the drum is on the spindle P., and the handle and levers are not operated.

The reel can be made perfectly silent at any moment during the casting of the lure, winding in the lure, working the lure, or playing the fish, without any alteration being necessary in the manner in which the hand or hands are holding the rod.

The three duties of the drum—free rotation, slight check, and full check of its normal condition, are distinguished when being made, not only by a difference in the pressure

of the finger on the lever, but by the different sound made by the two different pawls when in contact with the rachet wheel.

The ability to make the reel perfectly silent when winding in is not only a great comfort to most fishermen, but less likely to scare the fish at a critical moment, while the usual wear and tear of the reel is considerably reduced.

The entirely new invention of having two levers, each of which operates similarly in the mechanism of this reel, makes it both a left-handed and right-handed one at the pleasure of the fisherman.

The reel can be taken to pieces as shown in Diags. 26 and 27, and placed together in less than one minute. It is made of the very best material and will be found equally valuable as a reel for heavy or for light work.

When trout fishing with the trout model of the reel, it will be seen that the levers will always be within reach of the hand holding the trout rod, whether the latter be held above or below the reel, without the fisherman having to shift his hold on the rod (see Plate LX.).

The checking influence on the rotatory action of the drum cannot be exceeded, neither can the latter be brought up with an abrupt and disconcerting jerk, and this regulated control can be placed on or off the drum as it spins round, as often as is required during the progress of the lure through the air.

No other spinning reel has the same number of advantages, or can compare with it for the very great ease and comfort with which it can be used.

When the reel is in its normal fishing condition the ratchet wheel, R (Diagram 26) engages the pawl. As the cast is made a slight pressure of the finger on either lever handle, E E, forces this pawl out of engagement, and permits the free rotation of the drum. When required,

FIG. A.—PLAN SHOWING INTERIOR MECHANISM OF THE FRED G. SHAW SPINNING REEL. THE TWO PAWLS, SLIDING PLATE, SPRINGS, THE LEVERS AND THEIR HANDLES AND THE BUTTERFLY NUT.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

1. SHOWING HOW THE MECHANISM OF THIS SPINNING REEL IS CONTROLLED BY THE LOWER HAND.
2. SHOWING HOW IT IS CONTROLLED BY THE UPPER HAND.
3. THE SPINNING REEL AND THE TROUT ROD. THE LITTLE FINGER CONTROLLING THE LEVER HANDLE.
4. WINDING IN SILENTLY. THE LITTLE FINGER OF THE HAND HOLDING THE ROD, PRESSING THE LEVER HANDLE.

an increased pressure on the same lever handle forces another and more lightly controlled pawl (Fig M, Diagram 26) into engagement with the ratchet wheel, and thus prevents any chance of over-running, while finally the release of this pressure, as the lure enters the water, again brings the reel to its normal fishing condition.

This reel is standardized in sizes $4\frac{1}{2}$ and $3\frac{1}{4}$ inches.

The "Ephemeridæ" Fly Net and Priest

The flying water insects on which the trout will feed will vary from hour to hour, not only as regards their different families, but also in the colour and appearance of

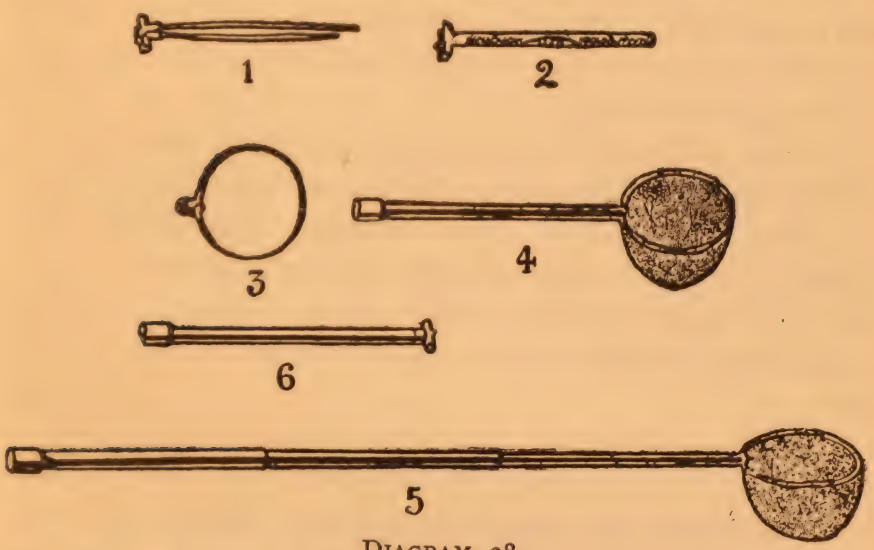


Diagram 28.

The "Ephemeridæ" Fly Net and Priest.

1 and 3.—Frame of net.
2.—Net on frame withdrawn from handle.
4.—Net ready for use, and fixed on handle.
5.—Handle extended.
6.—Priest with net inside.

When it is desired to use the net, Fig. 2 is withdrawn from handle, opened, and fixed (bayonet joint) on the telescopic handle (4). The handle is then extended and the net is ready for use.

the members of each family, and it is of the utmost importance, therefore, that the fisherman should be provided with some light and portable method of catching the elusive flying or floating insects on which the trout may be feeding.

The most useful adjunct to successful fly-fishing will be found to be a fly net. The author has invented and patented a very light, convenient, telescopic fly net, the handle of which forms another very useful little article known as a "priest," with which latter the *coup de grâce* is administered in order to put the trout beyond pain. This net and priest is shown in Diagram 28.* It is about twelve inches in length, when closed, and when the net, which is held in the telescopic tube, is withdrawn and fitted on the end of the telescopic handle and this is extended, it is three feet six inches in length, while the net and priest together only weigh seven ounces.

This net and priest can be easily carried in the creel or fishing bag, and when so desired it can be extended, and the net fixed in position in a few seconds. This enables the fisherman to secure the otherwise elusive insects on which the trout may be feeding, and thereupon to determine which of the many flies he carries in his fly box will be the one to use.

Gut

Of all the articles which we use when fishing, the gut, of which our casts are made, should be of the best. There is no trouble too great, or time so well spent, in selecting our fishing tackle, as that which we devote to obtaining good gut for our casts, and when once a really good seasonal make is discovered it is well to keep to that particular kind.

Always use the finest tackle consistent with safety, and in choosing your casts and traces I can give no better advice

* See also p. 69, 125.

than to go to the very best dealers. I have obtained excellent casts from all the following firms: Westley Richards, Harrods, Little & Co., Eaton and Deller, Ogden Smith, Cummins, Malloch, etc; alas! I have also been at times disappointed. In spite of every care, even the most reliable retail dealer may at times be unable to guarantee every cast he sells, and I should never condemn any good dealer for supplying me with a few faulty gut casts.

A make of cast which can be obtained from most retailers is the "Hercules" cast. So far as my experience has gone, I have found these casts good both in quality and durability. They are to be obtained from Little & Co., of the Haymarket. The cast for dry fly fishing should be three yards in length, tapering to the finest limit of safety. This limit should be decided by the state of the weather, the water, the time of the year, and the size of the trout inhabiting the water in which you are fishing.

Remember that the strength of the cast will be determined by its weakest length.

Experience will decide the degree of necessary strength for the fine points, and when new streams are tried the advice of a local fisherman or your tackle maker may well be sought.

Always have at least half a dozen casts of fine and medium gut in your box when away from a tackle shop, also a plentiful supply of fine gut points, fifteen to eighteen inches in length. During the day, when fishing, keep one cast in your damping-box, and always where possible soak a new cast for at least thirty minutes in lukewarm water before using it. Insufficient soaking or too much soaking may render the best gut unreliable. Keep your casts in a flat metal cast box, such as is sold by all tackle makers.

Sunlight, and light generally, is ruinous in its effect on gut. Your spare casts should never be left exposed to the

light, and for this reason should never be wrapped round outside the fisherman's cap, and the rod when not in use should be placed in the shade.

Before using your cast, every length should be carefully examined and tested. The gut should slip easily and smoothly between the fingers; it should exhibit no bright isolated patches, being of a uniform colour and tint throughout its length. Always remove your casts at night from the damping-box.

I prefer a very light blue or green tint for the colour of my cast.

The Dry Fly Box

The modern tendency as regards the size and shape of the boxes holding those flies which it is desirable or necessary to carry during any day's fishing, is to have a box as light and serviceable as possible, and at the same time small enough to be conveniently carried in any of the coat pockets.

In the protected design shown on Plate LXI. will be seen a fly box which possesses all these advantages, and which will also act as an entomological guide to the fisherman. The divisions are numbered, and the flies they contain are clearly seen without lifting the transparent lid of each compartment. The lid of the box contains two receptacles for May fly, or any other desired flies, and underneath are a series of lines marked with numbers, corresponding to the respective fly compartments below them. The names of the flies, therefore, which are kept in any one division should be written in ink on the line which is marked with a corresponding number, and this box becomes at once an entomological guide. For instance, if a fisherman is told that the Red Quill is being taken by the trout, if he does not know this fly, he looks at

THE
SHAW "INIMITABLE"
FISHING AND SPORTING SPECTACLES.

ALWAYS SAFE, ALWAYS READY, AND ALWAYS CONVENIENT.

FIG. 1.

FIG. 2.

THE SHAW
FLY RETRIEVER.

FIG 1.—THE FLY RETRIEVER IN CASE.

FIG. 2.—THE FLY RETRIEVER OUT OF CASE.

THE SHAW "INIMITABLE" FLY BOX.

LIGHT, CAPACIOUS AND SERVICEABLE, BOTH AS A FLY BOX AND AN ENTOMOLOGICAL GUIDE.

this index—which should be written up when the box is filled—finds the name of the fly and at once ascertains the number of the compartment in which it is contained, and he will thus acquire a knowledge of its exact colour and appearance.

If, on the other hand, he sees a fly on the water and wishes to know its name, he catches one (see Fly Net, page 411), and searches for a similar fly in one of the compartments. Directly he has found one that resembles it, he discovers its name by referring to the number on the lid of the box corresponding to the compartment in which it is kept.

The names of the flies written on the lid in ink can be easily rubbed out, and other names substituted, and thus this fly box can be made to carry from seventeen to twenty varieties of flies, and the varieties can be altered from day to day if desired.

On the lid of the box will also be found an exact table of the old and modern numbering of the flies, which will be found most useful when it is necessary to order a certain sized fly by letter or telegram from the fly-maker.

The Fishing Spectacles

As the years roll on and Nature begins to exact her toll on our faculties, the difficulty of threading the fine points of our cast through the minute eye of our trout fly will perhaps be more and more noticeable, and we shall find that in order to do so we have to hold our fly and our line a little further and further from the eye.

Our oculist will tell us that we must wear glasses, etc.; and when we get to our stream we shall then find that the ordinary form of spectacles or pince-nez, while they restore our sight, become in other respects an intolerable nuisance.

If they are spectacles they have to be taken from the pocket and adjusted to the nose, and two hands are required for this. This is somewhat awkward when you are wading, for you do not wish to put the butt end of the rod and the reel into the water.

If they are pince-nez, and can be fixed on the nose with one hand, then they must be attached to the person by a silk or other cord, and this means even greater annoyance, for the cord has to be freed from your coat and a multitude of obstacles—the strap of your creel or fishing bag, your trout net, etc., etc.

Not only does this occasion a loss of time, but annoyance and bother at a critical moment.

Pince-nez are perhaps the handiest form of glasses to use, but even these invariably get in the way, the hand continually catching in the silk cord, and the glasses being jerked off the nose. Spectacles are too much trouble, and take too long to place in position when the crisis of a "rise" is on, and the fly has to be changed, etc. After a variety of experiments I have invented and patented spectacle-frame attachments which can be easily fixed to the cap, and by means of which, the spectacles, when not in use, are kept on the peak of the fishing, cycling, or shooting cap, the fez, or the smoking cap, etc.

A single motion of one hand places the spectacles on the nose, and replaces them securely out of danger on a hook placed on the front of the cap, which hook prevents the glasses from coming down.

In both positions they are absolutely secure, and the cap can be lifted from the head with the usual ease whether the spectacles are on or off the nose.

The advantages of these glasses are many, and will be readily appreciated not only by sportsmen but by all short-sighted persons. The framework of the glasses can,

of course, be filled with any kind of lenses, and attached to any cap. I have now used these glasses for six years and can safely say that I have found this arrangement of the greatest possible comfort, not only when fishing, bicycling, etc., but when indoors. Plate LXI. shows these glasses when in use, and also when placed in perfect safety on the peak of the fishing-cap.

Fly Retriever

However carefully a fisherman may manipulate his rod and line, he may, after striking and missing a fish, find his line entangled in branches above his head. He may also, by neglecting to look behind him, when making a cast in some new direction, get into similar difficulties, in which case it is well to be provided with some means of retrieving the fly. One of my clients has invented a very excellent fly retriever, and has very kindly given me permission to take out a protection for it. It is the best implement of the kind I have yet seen. It is placed on the top end of a rod and thus lifted over the twig or leaves which hold the hook. The rod is then withdrawn, leaving the blade fast to the twig, which is then severed by the simple action of pulling on the cord which is attached to the fly retriever. The blade of the retriever is then placed inside its leather case, the cord is wound round both, and the fly retriever is returned to the pocket, or fishing bag, etc. (see Fig. 1, Plate LXI.).

Salmon and Trout Flies

I have already dealt in their respective places with both Salmon and Trout Flies, and my remarks are worthy of consideration by the fisherman who is about to purchase flies. The smallest possible selection of salmon flies should

be made in the first place, and in order to make this selection judiciously, those who have fished, or who are fishing, on the particular stretch of water to which the fisherman is bound, should be written to, and not only the names of the flies which are used, but the *sizes* which may be recommended, should be purchased for this particular fishing visit.

The reader should remember that each fishing centre has at least one local tackle dealer, and that such tackle maker is the best authority to whom to apply for information as regards the best Salmon or Trout flies to use. Therefore, it is well, when fishing a district new to the fisherman, that he should take advantage of such local knowledge and give the flies most commonly recommended in each district a trial.

The leading fishing tackle firms, or agents, whose establishments are near those rivers which are to be visited—such as Malloch for Scotland, Cummins for the North of England, Wyers Frêres for the North of France, etc., can be relied on, not only for selling the best class of flies, but for giving the soundest advice as to the flies most commonly used, or which are most likely to kill.

The Fly Fisherman's Knife

No ordinary article becomes more endeared to the average man than a good knife. To the fisherman a knife is indispensable, and in the knife shown in the diagram he is able to obtain one which contains all the tools he is likely to require at home or at the river-side. It is light, thin, and can be carried comfortably in any pocket ; furthermore, it is made throughout of the best material and silver plated. I have already shown in Chapters II. and III. the usefulness of this knife.

The tool, which acts as a file, lancet and disgorger, makes

an excellent manicure tool, and the file is so admirably tempered that it will cut through most metals with ease. I have experienced a considerable difficulty in easily picking out any particular fly from among its fellows in my fly-box, and to obviate this difficulty I have had the various tools in the knife magnetized, so that, whichever implement of this knife is being used at the moment, it can be applied

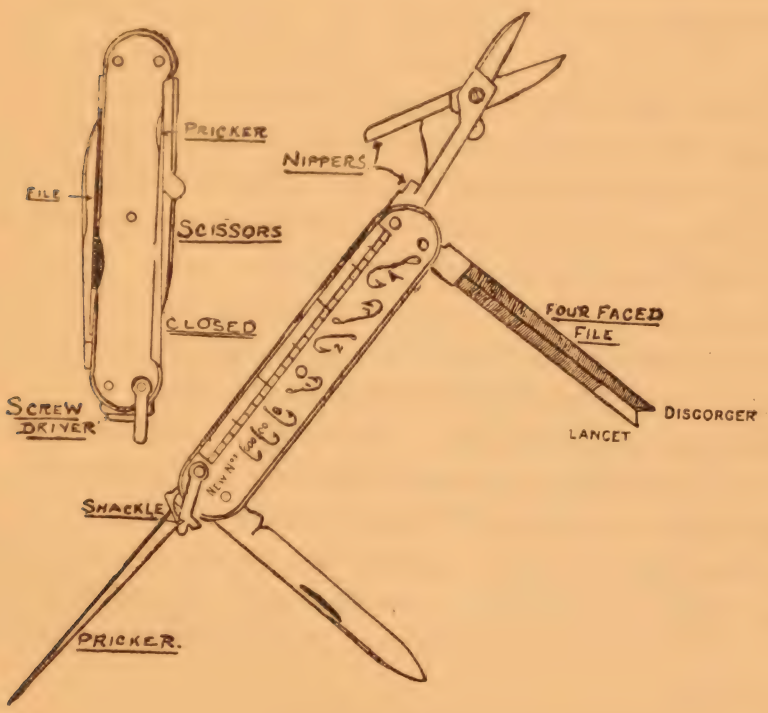


DIAGRAM 29.

SHAW'S FLY FISHERMAN'S KNIFE.

The fly fisherman's knife contains all the tools required by the fisherman. Disgorger, scissors, lancet, file, screwdriver, pricker, blade, fly gauge, measure. Weight, 2 ounces. Length, 4 inches. Thickness, $\frac{1}{4}$ inch.

to the particular fly required, and this fly will be easily and securely raised, by itself, without the other flies being disturbed or lost.

A difficulty which repeatedly besets the less experienced fly fisherman is the inability to place a distinctive title or number to the hook of the fly he is using, or which he wishes to use, and he is at some difficulty in describing the exact size of the flies he requires when wiring or writing to his tackle makers.

In order to overcome this perfectly natural difficulty, I have had engraved on my knife the exact size of the hooks corresponding to the old and new methods of numbering them. If, then, the fisherman desires to order by wire a fly, either larger, smaller, or equal in size to that which he thinks is the most favourable one for killing his fish, he has, when possessing this knife, the exact gauge always available. This advantage I have also protected in my design of a fly-box, which has already been described.

I have no hesitation in recommending this knife to my readers, as it is claimed by all who have purchased it to be the best and most desirable knife they have used.

Every one of these knives, which has so far been made, has been numbered consecutively, and the appreciation in which they are held will be gauged by the fact that the number now engraved on them has nearly reached 6,000. For further particulars as to this and the other articles mentioned in this appendix, see advertisements at the end of the book.

Matters connected with the hiring of Fishing Waters, the improvements of Trout Streams, the laying down of Fisheries, and Trout-breeding Establishments,

Not only as a fisherman, but in my profession as Civil Engineer, I have had numerous opportunities of improving the value and capabilities of many fishing waters. For

this purpose I have designed and constructed dams in the beds of fishing streams in Australia, South Africa, and Europe, and it is an important thing for all riparian owners to remember that however insignificant a stream may be, so long as it has a fairly regular current, it can be improved and in many cases made into a most fascinating trout proposition. Rivulets which are looked upon merely as ditches can, with a very small expenditure of money and time, be so improved as to be capable of carrying a very considerable head of sporting fish, and it is therefore worth while for those who possess water of any description in the land they own or occupy, to consider whether the improvement of such streams might not be of commercial as well as of sporting value to them.

To show the importance of the above remarks I insert a letter which I received in 1909 from some friends with whom I had stayed in Hungary the year before. Although one of the streams passing the castle appeared to contain the possibility of being made into a good fishing proposition, it was too rugged, too shallow, and too much swept during the springtime by the melting of the snows, to hold more than a moderate amount of fish. The letter speaks for itself as to the improvement which I suggested and designed :—

> "The dams which you suggested and designed were built last autumn, and they held well against the spring torrents, only one being washed away, and I think this was done by the loosening of a huge boulder on one side of the stream.
>
> The stream now holds a very great number of fish, and of a much larger size than those we had when you stayed here. My brother caught forty-two trout the other day in some of the pools nearest the house ; the largest fish was 1¾ pounds."

This extract shows very clearly how a stream can be improved, as the largest trout I was able to secure on this water when fishing there was just over half a pound, which was looked upon by the keeper as being an unusually large one.

My readers may no doubt be desirous of obtaining information with regard to the best, quietest, most sporting, cheapest, healthiest, or most convenient, etc., fishing inns and fishing neighbourhoods.

During the last forty years or so of my fishing experience I have compiled notes of the information derived from the personal memoranda of myself and my many friends, and as I have endeavoured to keep these notes up-to-date by asking my clients, when they have taken advantage of my recommendations, to send me the latest report as to the price, food, convenience, and sport of the places they have visited, I have much pleasure in offering to assist those who may be in want of such information.

The scope of this book will not permit me to attempt to give individual mention of such places, but I shall be very happy to assist any of my readers who may care to write to me by giving them the up-to-date results of such notes.

I make this offer because among those places which I have mentioned in my former books are one or two which have lost some of the sporting attractions which they then had. In the advertisement sheets of my book will be found particulars of one or two fishing quarters which I can specially recommend, and I also have much pleasure in drawing attention to the "Anglers' Guide," published by the *Field* newspaper, the *Field* itself, the *Fishing Gazette* and *Scottish Field*, etc., all of which will be found very useful.

There are also Fishing and Shooting Estate Agencies, such as the Edinburgh Shooting, Fishing and Estate Agency, under the direction of Sir James Duke, Bart., Mr. W. J.

Cummins' Agency of Bishop Auckland, Messrs. Wyers Fréres of Paris, etc., etc.

My articles on Canada and New Zealand will no doubt prove of value to those who are fortunate enough to be able to devote three or four months during the year to sport and travel.

The foregoing fishing novelties will be found more fully illustrated and described in the pages which follow the advertisers' index on page 432., together with other matters of importance to the fisherman. These pages contain the advertisements of those firms with whom I have had business dealings, and to whom I can with pleasure and confidence recommend the reader.

With these final remarks I bid my reader farewell, trusting that my experiences will be of practical use to him, and that I may have gained a kindly sympathetic thought somewhere in these pages.

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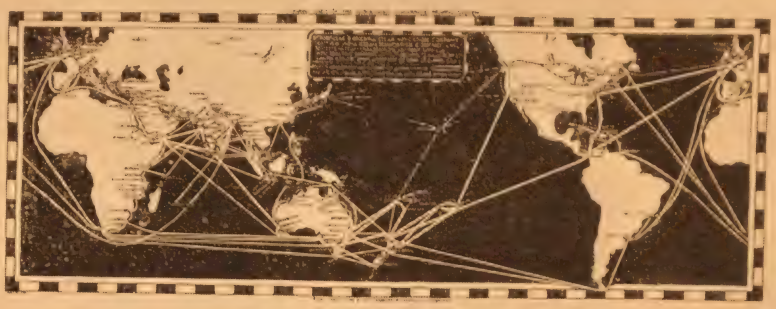

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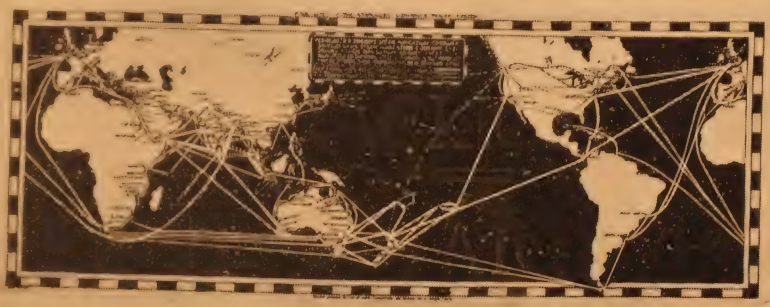

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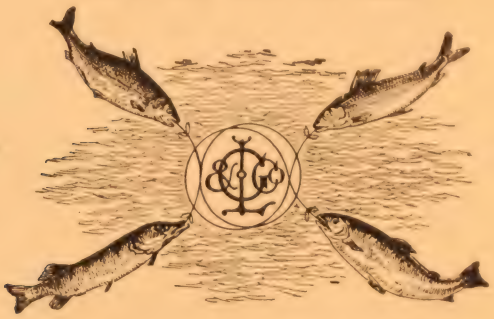
Trade  Mark.

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